DOCUMENT RESUME

ED 354 152	SE 053 059

AUTHOR	Malaspina, Mark; And Others
TITLE	What Works: Air Pollution Solutions. Report No. [illegible].
INSTITUTION	Environmental Exchange, Washington, DC.
PUB DATE	May 92
NOTE	125p.
AVAILABLE FROM	Environmental Exchange, 1930 18th Street, N.W., Suite #24, Washington, DC 20009 ($17; quantity price $12).
PUB TYPE	Guides - Non-Classroom Use (055)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Air Pollution; *Change Strategies; Citizen Participation; Curriculum Development; Depleted Resources; Elementary Secondary Education; Environmental Education; Hazardous Materials; Models; Natural Resources; Poisons; Pollution; *Problem Solving; State Action; Transportation
IDENTIFIERS	Emission Control; Emissions; *Environmental Action; Environmental Movement; *Environmental Problems; Ozone

ABSTRACT

This report profiles 69 initiatives and programs from across the country that are effectively reducing smog, air toxics, and chemicals that destroy the ozone layer. Problem solving strategies range from community pressure forcing reduction of industrial emissions, to municipal governments promoting transportation alternatives, to adoption of tough local pollution control laws. Each of the efforts is cited as having achieved dramatic and long lasting results. The report also provides a brief overview of the air pollution issues addressed, and explains major deadlines and opportunities for activists under the 1990 amendments to the Federal Clean Air Act. Chapter 7 (p85-94) is entitled "Air Pollution Education" and deals with both hands-on activities and curriculum development. Contact information is provided for each of the stories presented, and a resource section provides information on an additional 53 air pollution organizations. (MCO)

****
*   Reproductions supplied by EDRS are the best that can be made   *
*   from the original document.   *
****

WHAT WORKS

REPORT NO. 1

ED354152

AIR POLLUTION SOLUTIONS

South Capitol Street
EXIT
U.S. Capitol
C St. S.W.
HAZARDOUS CARGO PROHIBITED

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.

- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

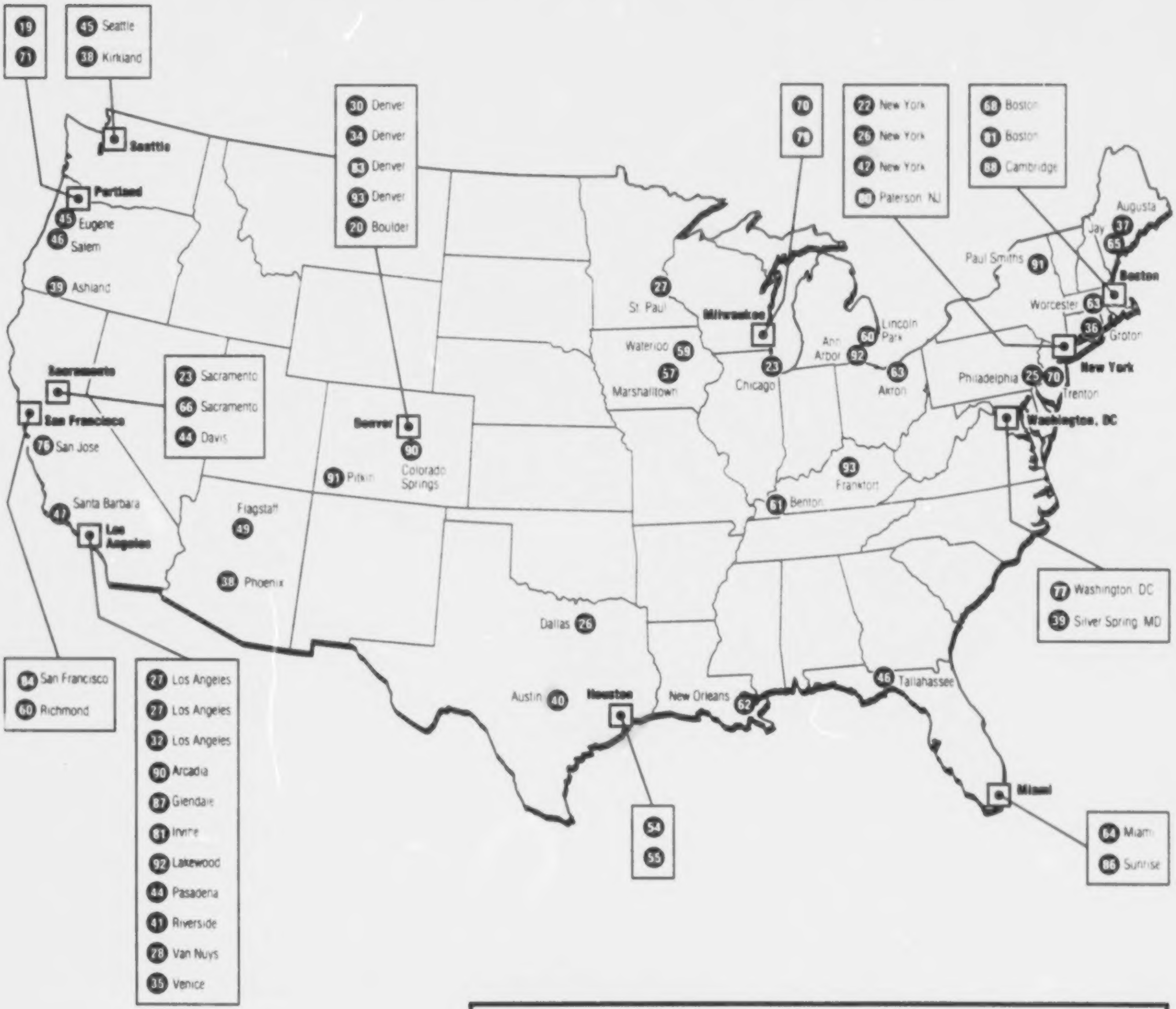
"PERMISSION TO REPRODUCE THIS MATERIAL IN OTHER THAN PAPER COPY HAS BEEN GRANTED BY
Kristin S. Schafer
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

SE053059

THE ENVIRONMENTAL EXCHANGE

BEST COPY AVAILABLE

WHERE THE SOLUTIONS ARE


19
71
45 Seattle
38 Kirkland
Seattle
Portland
45 Eugene
46 Salem
39 Ashland
Sacramento
23 Sacramento
66 Sacramento
44 Davis
San Francisco
76 San Jose
Santa Barbara 47
Los Angeles
84 San Francisco
60 Richmond
27 Los Angeles
27 Los Angeles
32 Los Angeles
90 Arcadia
87 Glendale
81 Irvine
92 Lakewood
44 Pasadena
41 Riverside
28 Van Nuys
35 Venice
30 Denver
34 Denver
83 Denver
93 Denver
20 Boulder
Denver
90 Colorado Springs
91 Pitkin
Flagstaff 49
38 Phoenix
Dallas 26
Austin 40
Houston
54
55
New Orleans 62
46 Tallahassee
Miami
64 Miami
86 Sunrise
27 St. Paul
Waterloo 59
57 Marshalltown
Milwaukee
70
79
23 Chicago
Ann Arbor 92
60 Lincoln Park
63 Akron
93 Frankfort
61 Benton
22 New York
26 New York
47 New York
80 Paterson, NJ
68 Boston
81 Boston
88 Cambridge
Augusta
Jay 37
65
Boston
Paul Smiths 91
Worcester 63
36 Groton
New York
Philadelphia 25 70
Trenton
Washington, DC
77 Washington, DC
39 Silver Spring, MD

KEY TO MAP

Each number on the map indicates the page number where a city's profile is found. The locators are color-coded by profile type, as follows:

● = Fighting Smog	● = Saving the Ozone Layer
● = Tackling Toxics	● = Air Pollution Education

WHAT WORKS

REPORT NO. 1

AIR POLLUTION SOLUTIONS

MARK MALASPINA
KRISTIN SCHAFER
RICHARD WILES

THE ENVIRONMENTAL EXCHANGE
WASHINGTON, DC
MAY 1992

Copyright © 1992 by The Environmental Exchange

First Edition

For reprint permission, additional copies, or other inquiries, contact

The Environmental Exchange
1930 18th Street NW, Suite #24
Washington, DC 20009
(202) 387-2182

TABLE OF CONTENTS

Acknowledgments v

INTRODUCTION

CHAPTER 1: WHY "WHAT WORKS" 2
CHAPTER 2: THE PROBLEM: OUR AIR POLLUTION CRISIS 5
CHAPTER 3: THE SOLUTION: STRATEGIES THAT WORK 10

PROFILES

CHAPTER 4: FIGHTING SMOG

What You Should Know About...SMOG 16

Profiles: Transforming Transit

Innovative Policies Clean Up Portland's Air 19
Boulder Bus Pass Offers Commuters Real Alternative 20
New York Businessman's Voucher Program Brings Transit Subsidies to Life 22
Reverse Commuting Pilot Program Carries Windy City Workers Out of Town 23
"No Frills" Rail Line Serves Sacramento 23
Broad Coalition Secures $280 Million for Pennsylvania Transit 25
Straphangers Wage Epic Battle for New York Transit System 26
Vans Shuttle Workers from Dallas Suburbs 26
Aerospace Vanpools Pave the Way in LA 27
Minnesota Vanpool Sets Corporate Standard 27
The LA Matchmaker: Commuter Computer 27

Profiles: Curbing Cars

Reducing LA Smog without Hurting Workers 28
Consumer Group Boosts Public Support for Rocky Mountain Oxyfuels 30
LA Oil Company Buys (and Scraps) Polluting Cars 32
Denver Professor Develops On-Road Tailpipe Testing 34
LA Coalition Forces Visionary Clean Air Plan 35
Environmentalists and Industry Gang Up on Car Pollution in Connecticut 36
Maine Environmentalists Set Model Air Quality Standard, Stop Highway Widening 37
Washington State Attacks Single Occupant Car Trips 38
Phoenix Gets Commuters Out of Their Cars 38
Oregon City Attracts Twice as Many Walkers 39
Maryland County Requires "No New Traffic" 39
The Oil State Looks to New Fuels 40

TABLE OF CONTENTS (CONTINUED)

Profiles: Boosting Bikes

California Company Convinces Commuters: Biking Is Better 41
Bike Advocates Take on New York City 42
California City Leads Nation in Bicycle Use 44
Pasadena Promotes Pedaling 44
Extensive Bikeways Bring National Recognition to Oregon City 45
Seattle Sets the Pace for Alternative Commuting 45
Sunshine State Spurs Two-Wheel Commuting 46
Oregon Sets Aside Funds for Bikeways 46

Profiles: Controlling Smog from Stationary Sources

Lawsuits, Media Blitz Force Emission Reductions in California 47
Grand Canyon Agreement Sets Visibility Precedent 49

CHAPTER 5: TACKLING TOXICS

What You Should Know About...AIR TOXICS 51

Profiles: Reducing Industrial Toxic Emissions

Low-Income Neighborhood Blocks Houston Ammonia Facility 54
Houston Citizens Negotiate with Giant Oil Company and Win Toxic Reductions 55
Iowa Company Approaches Zero Emissions Goal 57
Iowa Foundry Eliminates Dangerous Emissions 59
Citizen Negotiators Reduce Chevron Emissions in California 60
Video Tape Stops Coke Oven Pollution in Detroit 60
Cancer Deaths Near Chemical Complex Spur Kentucky Watchdog Group 61
Gulf Coast Social Justice Group Takes on Environmental Focus 62
Neighborhood Activists Reduce Plastics Plant Emissions in Massachusetts 63
Akron Storage Tank Accident Prompts Toxic Reduction Pledge 63
Citizens Put the Heat on Miami Incinerator, Get a Cleaner Burn 64

Profiles: Laws Attack Toxics

Maine Town Adopts Local Environmental Law over Paper Company Objections 65
California Enacts Tough Reporting Requirements 66
Comprehensive Approach Key to Success of Toxics Law in Massachusetts 68
New Jersey Tests Comprehensive Pollution Prevention Approach 70
Wisconsin Rules Require Industry to Reduce Emissions 70
Oregon Toxics Law Requires Reduction Plans 71

CHAPTER 6: SAVING THE OZONE LAYER

What You Should Know About...STRATOSPHERIC OZONE 72

Profiles: Phasing Out Ozone Depleters

Back to Basics: Soap Replaces CFCs at IBM's San Jose Plant 76
Industries Cooperate in Developing CFC Solutions, and Share Them Worldwide . 77
Wisconsin Utility Picks Up Old Appliances, Cuts CFC Emissions 79
New Jersey Company Develops New Packaging Material 80
Raytheon Phases Out CFCs Nationwide to Restore Its Image in Massachusetts 81

Profiles: Local Laws Ban CFCs

Irvine's CFC Reduction Efforts Lead to National Legislation 81
Denver Area Leaders, Activists Cooperate to Ban CFCs 83
Bay Area Citizen Group Wins Law Protecting Ozone Layer 84

CHAPTER 7: AIR POLLUTION EDUCATION

Teaching Air Pollution Solutions 85

Profiles: Hands-on Activities

Grade School Students Organize Carpools to Fight Florida Pollution 86
Simple Device Teaches California Kids about Ozone 87
Connecticut Students Become Air Pollution Experts 88
LA's Botanical Gardens Dramatize Smog's Impact 90
Colorado Game Show Teaches Clean Air Solutions 90
Teaching the Teachers: Adirondack Workshops Provide Air Pollution Training .. 91
Colorado Couple Designs Planet-Saving Software 91

Profiles: Curriculum Development

Hands-on Approach Teaches California Kids to "Think Earth" 92
Michigan Professor Develops Hands-on Clean Air Curriculum for High School Students 92
Kentucky Kicks Off Clean Air Campaign for Kids 93
Rocky Mountain Students Learn about Smog 93

RESOURCES

APPENDIX A: ANNOTATED LIST OF RESOURCE GROUPS

Smog 96
Bicycles 100
Toxics 101
Stratospheric Ozone Protection 104
Environmental Education 104

TABLE OF CONTENTS (CONTINUED)

APPENDIX B: BIBLIOGRAPHY 107

A Note on Researching *What Works* 111
About The Environmental Exchange 113
Reader Response Card 115
Photo Credits .... inside back cover

SIDEBARS

Good Ozone, Bad Ozone 6
Toxic Air in Your State 7
Air Pollution and Global Warming 9
Federal Laws Arm Citizen Watchdogs 13
Environmental Protection ≠ Job Loss 14
Know Your Clean Air Deadline 18
Auto-Free Cities 21
Free Parking: Giant Tax Loophole 22
Public Rail: Cleaner, Cheaper, and Safer 24
Know Your MPO: Citizen Access to Transportation Planning 25
Citizen Action Can Get Cars Off the Road 29
Cleaner Gas: A Good First Step 31
Auto-Mania: What It's Doing to Us 33
Cheap Gas: Americans Get Off Easy 36
High Occupancy Vehicle (HOV) Lanes Work 38
Alternative Fuels Cut Emissions 40
Bicycles: The Elegant Pollution Solution 43
Acid Rain, Aerosols, and Haze: The Effects of Sulfur Dioxide 48
The Soy Solution to Print Pollution 50
Where Toxics End Up 52
Citizens in Court: How to Sue Polluters 56
Getting to Zero 58
Incinerators Mean Dirty Air and More Trash 64
Getting a Leg Up on the Feds 66
TRI: Federally Required Toxics Inventory Is Better Than Nothing, but Leaves Much to Be Desired 68
The Ozone Destruction Process 73
Where Are All Those Ozone Protection Laws? 75

ACKNOWLEDGMENTS

This report would not have been possible without the support and advice of many people. At the top of the list are the individuals and organizations featured in *What Works*. We thank them for taking time to explain their work, and for agreeing to help others who may contact them to build on their success. We also appreciate the invaluable insight provided by scores of activists and experts from across the country who helped us find and verify the effectiveness of all of the stories in this report.

Thanks also go to the reviewers of the report: Marc Chytilo, Janet Hathaway, Susan Mudd, Sara Nichols, Debbie Scheiman, and Greg Whetstone. Their technical expertise and perspective was extremely helpful.

Last, but surely not least, we thank our funders, and especially Judy Donald of the Beldon Fund for her unflagging encouragement and sage advice. The following foundations provided support for this project, and for the ongoing work of The Environmental Exchange:

The Mary Reynolds Babcock Foundation

The Bauman Foundation

The Beldon Fund

The Changing Horizons Charitable Trust

Church and Dwight Co., Inc.

The Tides Foundation

The Wallace Genetic Foundation

Editor
David Riley

Project Director
Richard Wiles

Production Coordinator
Kristin Schafer

Design and production
Kevin Cross, Free Hand Graphics

Printing
Ecoprint, Silver Spring, Maryland

INTRODUCTION

CHAPTER 1

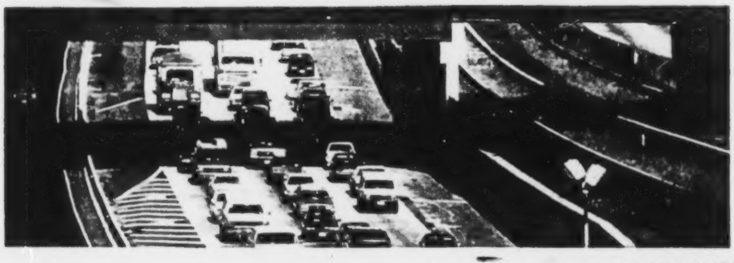
WHY "WHAT WORKS"

CHAPTER 2

THE PROBLEM: OUR AIR POLLUTION CRISIS

CHAPTER 3

THE SOLUTION: STRATEGIES THAT WORK



EST COPY AVAILABLE

CHAPTER 1

WHY "WHAT WORKS"

The United States is a country of optimists. When we see an important job that needs doing, we tend to believe we can do it. We have often succeeded against great odds: we migrated across a great ocean, defeated the British, recovered from Civil War and Depression, and landed a man on the moon. In the face of a difficult task, we are more likely to roll up our sleeves than throw up our hands.

Today we face what may be our most difficult task: preserving a healthy and functioning environment for generations to come. Many of our environmental problems seem hopelessly complicated. Despite our best efforts, the bad news continues: our landfills are filling up, the air in our cities is still foul, wetlands and forests continue to disappear, the ozone hole grows, and the world's climate keeps getting warmer. In many places the most basic elements that support life — air, water, and land — now threaten life rather than sustain it. The federal government has let this calamity happen; in fact, in many cases government policies have helped make it happen.

COMMUNITIES TAKE THE LEAD

Fortunately, many people are responding to this environmental crisis with energy rather than despair. Rather than waiting for government directives, people are directing their own efforts to save the earth. This burst of citizen activity goes far beyond individuals separating glass and plastic from their trash, important as such steps are. In hundreds of communities across the country, community activists, government officials, and business employees are taking collective action to clean up and protect their environment.

Most of these community efforts are little known outside their immediate area. Americans need to know what their fellow citizens are doing to save the earth. Such information would give us all more hope, and inspire many of us to action. *What*

Works fills this gap. It shows how people are effectively working together to solve tough environmental problems. Consider these examples:

- In Portland, Oregon, the city's innovative mass transit system and land use plan have reduced the number of days of carbon monoxide violations from more than 100 a year to nearly zero, while the number of people working downtown has increased by two thirds.
- Osage, Iowa saved so much energy through conservation and energy efficiency measures that the local sock factory used the savings to add more than 150 jobs.
- Jay, Maine passed a town ordinance that requires the local paper mill to substantially reduce pollution. The law is enforced by local officials and has not resulted in job losses.

These and hundreds of other stories like them don't make national headlines, and their importance is often overlooked. Yet they are important, because they reflect the common sense spirit of initiative that is essential to solving our environmental problems. They are important because they provide the impetus for the kind of major social change that saving the earth will require. The great social movements throughout our history — the abolition of slavery, women's suffrage, and the fight for civil rights — all had modest local beginnings, yet moved with compelling moral force, creating political energy that spread from community to community and state to state until it transformed the nation.

The environmental movement is following the same pattern. Its impetus rests in people who are angry about the contamination of their communities, people who don't want their children to get cancer from a local factory's wastes, people who value the richness of animal and plant life, people who demand clean air and clean water and are willing to fight for it.

Part of the genius of our three-tiered system of government — federal, state, local — is that it provides hundreds of small-scale laboratories for trying out social policies. The system is particularly useful for testing solutions to environmental problems, which are often acute at the community level and cry out for local solutions but also require broad-scale national and even international remedies.

Knowledge is power, but only when that knowledge is shared. *What Works* greases the wheels of our federal system by giving hundreds of unpublicized state and local programs much needed exposure so they can be duplicated, improved on, and expanded in scope. These reports encourage this crucial cross-pollination of ideas.

What Works reports are filled with examples of communities leading the way toward solving environmental problems. They show that local and regional innovation is leading the country — including the federal government — toward change. People provide this national leadership in four principle ways:

- They develop innovative local environmental programs that can be replicated on a broader scale, such as recycling and waste reduction programs, innovative transit pass initiatives, support for bikes and light rail systems, or creative financing for water pollution control;

A sustainable society must be developed incrementally, one practical step at a time.

- They test organizing strategies for citizen action that others can use and modify. Examples abound, including media pressure, intervention in the pollutionpermitting process, protests, boycotts, town meetings, marches, working with unions, documenting pollution on video tape, and producing well researched reports, to name just a few;
- They pass laws that other jurisdictions can copy, on issues from land use to energy efficiency and pollution control; and
- They implement federal legislation locally, which often sets standards for national implementation.

MOVING TOWARD A SUSTAINABLE SOCIETY

Technological innovation plays an important role in solving our environmental problems, but it alone is not enough. Our environmental problems are far too pervasive to be solved by a technical fix. The polluting practices of our industries and the wasteful habits of our lifestyle go back for generations, with roots in the beginning of the industrial age over 150 years ago. Behavior so culturally inbred requires major social change to reverse.

Progress rarely happens unless someone demands it.

The changes required involve our most fundamental values. They challenge the long standing assumptions that our basic resources — air, water, land, energy, plant and animal species — are essentially unlimited and therefore can be used at will.

We are now beginning to understand that these resources are in fact limited and invaluable, and that we must organize our lives and our economies in a way that does not permanently damage them. This effort to develop a sustainable society is a huge undertaking that obviously cannot be accomplished overnight. It must be done incrementally, one practical step at a time. And it must be done with minimal economic disruption. If the short-term costs of this change are too great, people will lose sight of the long-term benefits — and the necessity — of switching to a sustainable economy.

What Works shows how Americans are finding ways to make that crucial transition. In practical terms, these stories define sustainability. They point the way toward reforming our wasteful ways, by showing how we can become less dependent on automobiles, less abusive of natural resources, more efficient in our use of energy, and more respectful of other living things.

All these stories of local success raise our expectations of environmental quality. When we read about an activist group successfully negotiating with a large oil company to reduce local pollution, or about a community where 25% of all transportation is by bicycle, or about a company reducing its toxic emissions to zero, we might well ask, "Why can't we do that too?"

But progress rarely happens unless someone demands it. *What Works* encourages people not to settle for perpetual environmental decline. These stories of human energy, ingenuity, and determination show that we need only look to ourselves to create the ecologically sustainable social system that will ultimately change the world.

CHAPTER 2

THE PROBLEM

Our Air Pollution Crisis

We tend to take our air for granted. Since it is free, usually invisible, and always around us, we don't think much about how we pollute the air, or how that pollution hurts us.

Air may look fine to the naked eye, even when it is literally killing people. Air pollution doesn't produce dramatic pictures of oil-soaked ducks and dead fish, but it actually causes a thousand times more harm to humans and to nature than the largest oil spill.

Air pollution is not a one-time thing; it goes on and on, day in and day out, for years and then for decades. This continuing output of pollution from our factories and cars has transformed one of life's most essential elements — air — into a major health hazard. Tens of thousands of people die each year from breathing polluted air.

This report examines three air quality problems that are particularly harmful to people: smog, toxic chemicals, and depletion of the stratospheric ozone layer.

SMOG

Most people recognize smog. It's visible air pollution that you can feel in your lungs and throat, and sometimes even taste. Smog was long thought to be simply the product of smoke and fog. Unfortunately, the problem is much more complicated and serious than that.

Today 150 million Americans — more than half the total population — live in metropolitan areas that regularly violate one or more of the air quality standards set by the Environmental Protection Agency (EPA). Ground-level ozone and carbon monoxide are the two most stubborn pollutants contributing to smog and are commonly found at unsafe levels in scores of cities across the country.

Nearly two thirds of all smog-forming chemicals are produced by automobiles. Public utilities and factories are responsible for the rest. Air pollution from cars causes as many as 120,000 premature deaths each year — or 6% all deaths in the US —

Nearly two thirds of all smog-forming chemicals are produced by automobiles.

— according to studies released by the American Lung Association. These studies also show that this pollution is responsible for $40–50 billion in annual health care costs.

Many states have substantially reduced air emissions in response to federal standards set in the 1970s. The phasing out of leaded gasoline, for example, has helped reduce lead pollution dramatically. But while antipollution devices have made car engines much cleaner, the vast increase in the number of cars on the road and the number of miles we drive has kept air pollution levels dangerously high.

And most of us are headed in the wrong direction. We drive twice as many cars three times as many miles as we did 30 years ago. Although we make up only 5% of the world's population, we drive as many miles as the rest of the world combined. Today Americans drive 167 million cars and light trucks two trillion miles each year — the equivalent of a round trip to the planet Pluto and back. And consider this: if current rates continue, we will double this total in just 20 years.

Good Ozone, Bad Ozone

Unlike the stratospheric ozone layer, which protects us from harmful ultraviolet light, ground-level ozone can pose a serious health hazard.

Why can't all the "bad" ground-level ozone in our urban air help replenish the stratospheric ozone layer? Ozone produced on earth can't refill the ozone layer in the stratosphere because ground-level ozone has a limited life span. It soon combines into other substances and doesn't last long enough to work its way up to the stratosphere.

TOXIC AIR POLLUTION

Toxic chemicals are hazardous to human health and the environment, even in relatively small doses. Yet every day we pump thousands of toxic pollutants into the air we breathe. More than half of the toxics in the air come from motor vehicles (half of this from vehicles that run on diesel fuel), and most of the rest are from factories and incinerators.

Toxics contaminate groundwater, soil, and threaten the health and safety of workers in addition to causing air pollution. Here we focus specifically on communities organizing to fight air toxics. (Toxic emissions from solid and hazardous waste incinerators will be addressed more thoroughly in our upcoming *What Works* report on toxics.)

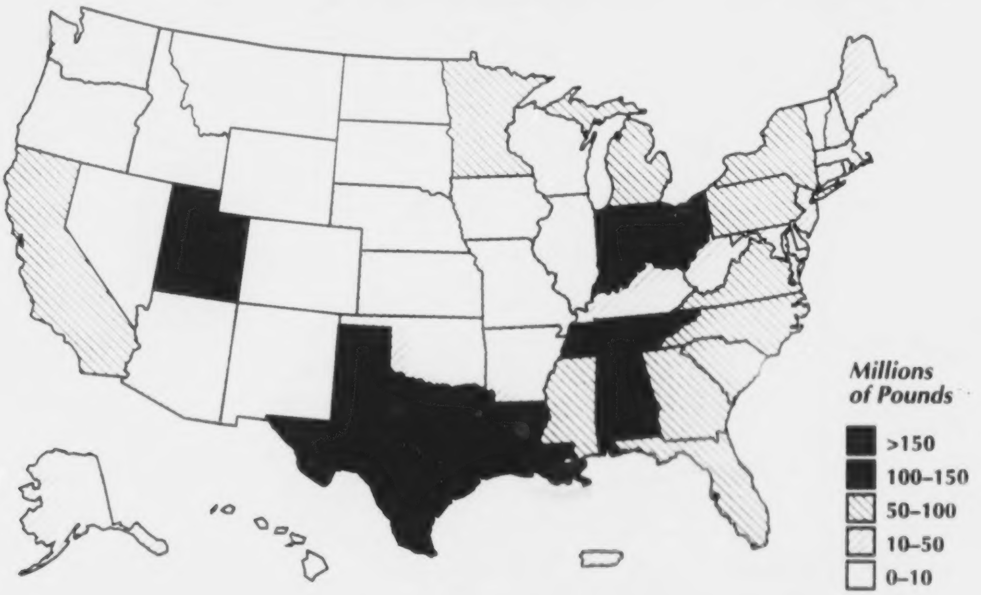
According to EPA, 140,000 of the people alive today in the US — roughly the population of Dayton, Ohio — will get cancer during their lifetime from toxic air emissions. The actual numbers are probably substantially higher, because EPA has yet to evaluate many industries and businesses that release toxics, hundreds of additional toxic compounds, and secondary pollutants formed when chemicals mix in the atmosphere.

Living near sources of these chemicals is especially dangerous. EPA estimates lifetime cancer risks are as high as one in 100 for people living near certain polluters (that's 10,000 times greater than the acceptable standard in the federal Clean Air Act). Birth defects, reproductive disorders, and brain and nervous system damage are also possible from high-level exposure to toxic substances.

Plus there's the risk of accidental releases and explosion. During a seven-year period in the 1980s, more than 11,000 accidental releases of air toxics killed 309 people, injured 11,341, and forced the evacuation of nearly 500,000, according to EPA.

Toxic Air in Your State

Figures do not include motor vehicles, which account for one half of all air toxics



Source: Toxics in the Community: The 1989 Toxics Release Inventory National Report, *EPA, 1991.*

What has the federal government done about all this? So far, very little. In 1970 Congress directed EPA to regulate 320 toxic pollutants. To date the Agency has set standards for only seven. In other words, it took EPA 20 years to carry out 2% of its mandate to control toxic air pollution. And only one of those seven pollutants, benzene, is among the top 50 substances emitted by industry. While the feds fiddle, toxic pollution keeps flowing: less than a third of all factories reporting toxic releases in 1987 claimed to use any emissions controls at all. And airborne toxics from cars will remain virtually unregulated for the next decade.

What we don't know is cause for yet more concern. We remain virtually ignorant about many essential air toxics issues: the threat from chemicals not currently considered toxic, the overall level of toxics in the air, and the potential health risks posed by current emissions. In the early 1980s, the Reagan Administration discontinued government research on the health effects of 30 of the most threatening toxic pollutants. The federal government has stalled not only in regulating toxics, but in researching their impact on the public as well.

Every day we pump thousands of toxic pollutants into the air we breathe.

STRATOSPHERIC OZONE DEPLETION

You can't see it. You can't feel it. But it's trying to save your life. For 450 million years, the ozone shield has protected life on earth from ultraviolet radiation. Now, thanks to our widespread use of synthetic chemicals, the ozone layer is withering away and dangerous ultraviolet light is streaming through.

Destruction of the ozone layer is caused when synthetic chemicals such as chloroflourocarbons (CFCs) react with sunlight in the upper atmosphere. This reaction transforms the complex chemicals into chlorine atoms that demolish the earth's thin ozone shield. The largest single source of ozone-depleting chemicals is automobile air conditioners; industrial solvents, refrigerants, and chemicals used in fire fighting equipment account for the rest.

Measurements over Antarctica have shown depletion of more than 50% of the ozone layer over the southern pole. And NASA scientists predict that given the right combination of events in the upper atmosphere, the ozone layer over the northern hemisphere could erode by as much as 30–40% during the spring and summer of 1992.

As the ozone shield crumbles, damage to human health rises.

As the ozone shield crumbles, damage to human health rises. Based on only a 10% thinning of the ozone layer, a panel of the United Nations Environment Programme predicted that additional ultraviolet radiation reaching the earth would cause 300,000 additional skin cancers and 1.6 million additional cases of cataracts worldwide each year.

Concern over the possibility that CFCs could destroy precious stratospheric ozone led the federal government to ban CFCs in most aerosol sprays in 1978. Anticipating further government regulation, industries began to look for safe alternatives to CFCs. But in the early 1980s, progress came to a standstill. President Reagan seriously weakened EPA, the threat of future government action subsided, and the search for substitutes virtually stopped. Unfortunately, ozone depletion didn't. By the late 1980s, international efforts to protect the ozone layer were well under way, fueled by evidence of the alarming disintegration of our stratospheric shield.

Keeping the Heat On

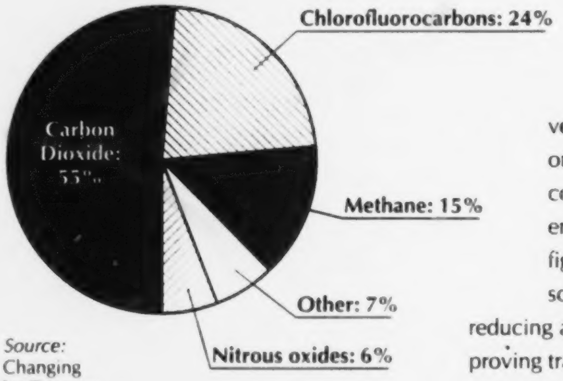
Air Pollution and Global Warming

The earth is heating up. Eight of the warmest years on record were in the last decade, and 1990 had the hottest temperatures since records were kept. Why? Because we're injecting massive quantities of gases into the atmosphere, and accelerating the naturally occurring greenhouse effect.

The Greenhouse Effect

This is how it works: light from the sun passes through transparent gases to the earth, where short-wave radiation (light) becomes long-wave radiation (heat). Without the natural greenhouse effect provided by the atmosphere, much of the heat which then rises from the earth would escape into space and ground-level temperatures would be very low. Greenhouse gases like carbon dioxide absorb long-wave radiation, and for thousands of years have held in just enough heat to maintain life-supporting temperatures.

Contributions to the greenhouse effect during the 1980s



Source: Changing by Degrees, *US OTA, 1991.*

This is the problem: we're adding greenhouse gases to the atmosphere at an incredible rate. The more these gases accumulate, the more heat they absorb. This means less heat escapes, and ground-level temperatures go up. While scientists disagree about the impact of this global warming, there is now general concensus that a doubling of carbon dioxide in the atmosphere (which could occur by the year 2075) would raise temperatures from two to four degrees centigrade. And these projections are based solely on increased carbon monoxide levels — estimated temperatures go up much sooner if other greenhouse gases (like methane and nitrous oxides) are factored into the equation. While a few degrees may not sound like much, these changes represent a more rapid shift in global temperatures than the climate changes that wiped out the dinasours.

The Antidote: Cutting Emissions

Carbon dioxide emissions worldwide are responsible for about half of the greenhouse effect. According to the federal Office of Technology Assessment, motor vehicles account for about one quarter of this country's carbon dioxide emissions. So the smog-fighting measures described in this report (e.g., reducing automobile use and improving transportation efficiency) are essential to combating global warming as well.

International efforts are under way to address the threat of global warming. Many hope that a substantive agreement will result from the UN Conference on Environment and Development ("Earth Summit") to be held in Rio de Janeiro, Brazil in June 1992.

CHAPTER 3

THE SOLUTION

Strategies That Work

Some of the stories in *What Works* involve technological discoveries, such as an on-road test for car pollution, but the success of most of these local programs depends on a few simple ingredients:

- the refusal of citizens to accept the degradation of their environment;
- their determination to save it in the face of all the people who tell them it can't be done; and
- their willingness to work together with fellow environmentalists and others whom they may have once considered antagonists — government officials and business executives — to reach agreements and institute change.

New alliances are forming across the country between workers, environmental advocates, people of color, and leaders concerned with the environmental health of their community. These coalitions are achieving startling results.

To find the path to cleaner air, one must look far beyond the halls of government in Washington, DC to citizens and leaders in small towns, cities, and state capitals across the country. This is where the best ideas sprout, take root, and grow, often into national and even international policies. It is also where the federal Clean Air Act, by design, is implemented. Efforts to reduce air pollution take many forms and are often tailored to the situation at hand. Here are some of the innovative strategies that people are coming up with, and the significant results they produce:

Community Pressure Forcing Reductions in Industrial Emissions. Capitalizing on emissions data collected by the federal government and some states, activists from Akron, Ohio to Silicon Valley, California have used direct action and media pressure to successfully reduce emissions from major industrial facilities.

Tough Local Pollution Control Laws. In communities like Jay, Maine and Irvine, California, local officials have adopted tough air pollution laws. Such cases demonstrate that stringent controls can be applied to locally dominant industries with minimal, if any, loss of jobs.

Enforcing the Clean Air Act. Local groups from coast to coast have gone to court to enforce the federal law, often with precedent-setting results. For example, the much heralded air quality improvement plan for Southern California is the result of a lawsuit brought by the Coalition for Clean Air in Los Angeles.

Citizens Negotiating Directly with Industry. Using citizen protests, media pressure, and interventions in the permitting process, local groups from Houston, Texas to the Grand Canyon have brought industrial giants to the negotiating table. Under the right circumstances, face-to-face negotiations can yield dramatic pollution reductions, usually far more quickly than lawsuits.

Alternatives to Commuting by Car. Some communities, such as Portland, Oregon and Davis, California, have reordered transportation and growth priorities to reduce air pollution from automobiles dramatically. Other regions (including the Colorado Front Range and the Delaware Valley) are adopting innovative measures to restore rail infrastructure and increase transit ridership.

Model State Laws. Meeting clean air goals will require basic changes in manufacturing processes and transportation patterns. In some states, like New Jersey, activists, government officials, and business representatives are working together to create laws that increase cooperation, allow public access to decision making, and promote basic changes in the way we do business.

Industrial Pollution Prevention. Through increased efficiency, employee involvement, and technological innovation, some industrial polluters are reducing their harmful effect on the environment and saving money at the same time.

Entrepreneurship. Enterprising individuals can provide concrete solutions to environmental problems. Privately run commuter check programs and remotely located auto emission monitoring devices are just two examples of individual inventiveness that are helping to clean the air.

The question is no longer can we clean up the air; the question is do we have the will and the wisdom to do it. As the President's Council on Competitiveness works to gut the federal regulatory process and implementation of the 1990 Clean Air Act amendments, pressure mounts on states, localities, businesses, and activists to prove that the standards of the Act are not only reasonable, but can be exceeded by hard-nosed visionaries.

After all, local air quality initiatives formed the basis for many of the 1990 improvements to the Clean Air Act. They will undoubtedly set the standards for the future.

The question is no longer can we clean up the air; the question is do we have the will and the wisdom to do it.

WHERE DO WE GO FROM HERE?

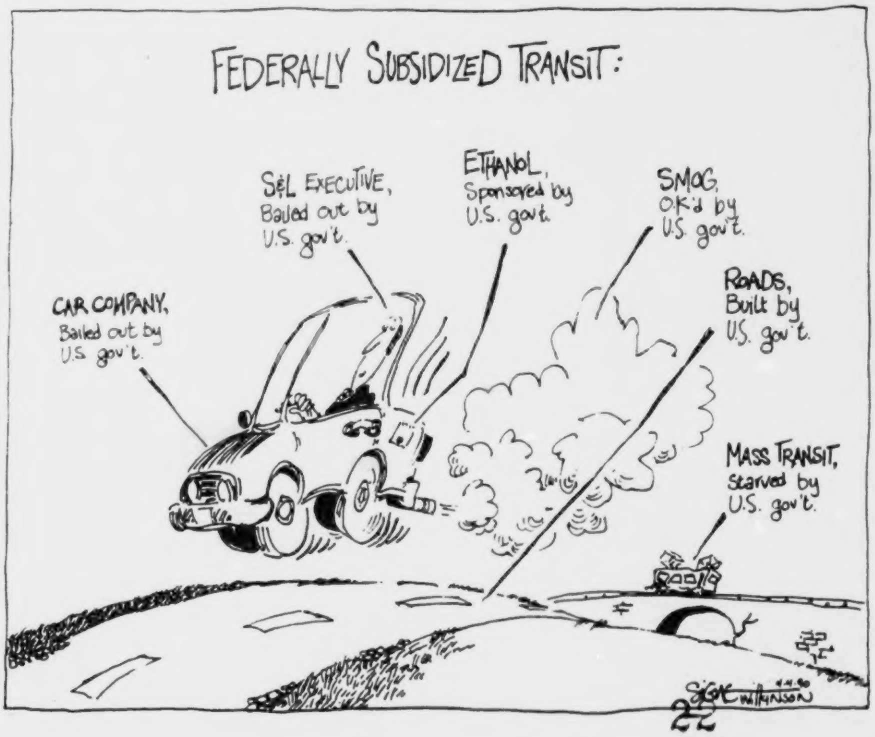
Smog: Reforming Transportation

To date, this country has had little success in reducing air pollution from cars and trucks, the primary source of smog. But the 1990 Clean Air Act amendments, together with the new federal transportation law known as the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA — pronounced "Ice Tea"), lay the groundwork for substantial improvements.

These two laws present an opportunity to restructure America's transportation system. The 1990 amendments for the first time specifically require that state and local *transportation plans* meet emissions targets set by state *air quality plans*. A review of compliance with clean air goals is now required every three years, providing numerous opportunities for citizens to monitor their state's progress toward clean air.

In part to accommodate objectives of the Clean Air Act amendments, the transportation law provides record levels of mass transit funding and unprecedented local authority to spend highway dollars on other modes of transport. ISTEA provides up to $89 billion that can be spent over the next six years on alternatives like light rail, bike paths, and clean buses. This means that more than half of the overall budget to revitalize the nation's transportation infrastructure can now be spent on alternatives to automobiles. In a nutshell, new roads that boost emissions may be in trouble.

But real improvements are hardly assured. First, highway, auto, and oil interests are entrenched, well funded, and organized. Second, laws are new and complex, making organizing even more of a challenge. With billions of dollars hanging in the balance, the fight for flexible transportation funds provided by ISTEA will be ferocious. But the opportunity is at hand: communities can use federal clean air standards and transportation dollars to create a fundamentally less destructive transportation system.


FEDERALLY SUBSIDIZED TRANSIT:
S&L EXECUTIVE, Bailed out by U.S. gov't.
ETHANOL, Sponsored by U.S. gov't.
SMOG, O.K'd by U.S. gov't.
CAR COMPANY, Bailed out by U.S. gov't.
ROADS, Built by U.S. gov't.
MASS TRANSIT, Starved by U.S. gov't.
Signe Wilkinson 4-4-90

Air Toxics: Reducing Pollution at the Source

The best solution to the air toxics problem is not controlling the *release* of toxics, but preventing them from being produced in the first place. Businesses can achieve dramatic emissions reductions by modifying their production processes, often benefiting from long-term savings in the bargain. Called pollution prevention or toxics use reduction, this strategy has been adopted by various states in recent years. Twenty-five states currently have some kind of pollution prevention program, often involving specific waste reduction goals and penalties for noncompliance. Some states, such as Massachusetts, have been particularly effective in helping businesses reduce the use of toxic chemicals through technical assistance and information exchange programs. The federal government now encourages pollution prevention approaches as well.

But even where laws are strong, constant citizen vigilance is needed to keep government and businesses on their toes. Recent federal laws give citizens access to information about industrial emissions and opportunities to sue polluters for cash penalties (see sidebar below). With these tools, citizens can employ public and political pressure, demand direct negotiations, and in some cases win cooperative agreements to push governments and industry toward safer operations.

Federal Laws Arm Citizen Watchdogs

The Toxics Release Inventory

Information breeds knowledge, and knowledge is power. For environmental activists, the federal Toxics Release Inventory (TRI), established by the 1986 Emergency Planning and Community Right to Know Act, is an important source of all three. Under the Act, industries are required to report annual releases of 330 chemicals to EPA; these figures are then made available to the public.

The TRI plays a crucial role in encouraging citizen action to control pollution. Although there are significant loopholes in the reporting requirements (see sidebar on page 68), the TRI has provided invaluable information for citizen groups seeking to reduce toxic pollution in their communities. Citizens can sue polluters who don't report toxic releases as required, and polluters found guilty of failure to report can be fined up to $25,000 per chemical, per day.

The Clean Air Act

The Congress has made it easier for citizens to sue polluters for cash penalties. Under the 1990 amendments to the Clean Air Act:

- Industrial polluters (stationary sources) will be required to report regularly on their compliance with the new standards. These reports will arm citizens with crucial information which they were often unable to get in the past.
- Citizens will be able to seek civil damages in fines up to $100,000 when polluters fail to comply, whereas under the pre-1990 law they could only win a court order to stop illegal emissions. The fine can either (1) go into a US Treasury fund to finance air compliance and enforcement activities or (2) be designated by the court to specific pollution mitigation projects.
- Anyone providing information leading to polluter convictions may receive a $10,000 reward.
- Citizens will be able to sue local and state governments if their regional transportation plans don't conform to state clean air goals as approved by EPA.

Unfortunately, none of these provisions will kick in until EPA develops emissions standards, implements its new permitting program, and approves State Implementation Plans — a process which could take several years. For information on how to act on these opportunities, call the Clean Air Network (see page 97).

BEST COPY AVAILABLE

The task is to help small businesses adopt ozone-safe technologies with a minimum loss of jobs.

Stratospheric Ozone: Easing the Transition to a Post-CFC World

As the threat to our ozone layer becomes clearer, the timetable for eliminating ozone-depleting chemicals becomes shorter. In early 1992, President Bush moved up the CFC phaseout date for this country from the year 2000 to December 31, 1995. As a result, many companies using CFCs and related compounds are now scrambling for substitutes.

The accelerated schedule to save the ozone layer could create unnecessary economic hardship, especially for smaller businesses. To avoid this will require unprecedented cooperation between activists, government leaders, and large and small businesses. The task at hand is to help small businesses and local manufacturers implement ozone-safe technologies with a minimum loss of jobs.

Environmental Protection ≠ Job Loss

Too often, large polluters turn pollution abatement into an ugly confrontation between jobs and the environment. Yet this trade-off is usually unnecessary. Environmental strategies that protect and even create jobs are being tested in communities across the nation. Few if any jobs were lost as a direct result of any of the actions described in this report.

Alternative Transportation Creates Jobs

Reform of our transportation system presents the greatest potential to create jobs as we clean the air. According to a 1991 study by Dr. Alan Aschauer of Bates College, economic output from investment in transit infrastructure exceeds economic output from highway expenditures by more than two to one. Data from Germany show that one billion dollars spent on light rail track construction creates 7,000 more jobs than the same amount spent on highways.

The Los Angeles County Transportation Commission is moving to capitalize on this potential. Commissioners decided recently to cancel a contract for imported light rail cars and to support instead the development of local light rail manufacturing. The commission is studying the potential to make rail cars in LA using existing facilities and a talented (and increasingly unemployed) aerospace and defense workforce. The county will purchase 600 light rail cars and 6,000 standard and electric buses over the next 30 years.

Preventing Pollution Means Savings, Not Layoffs

Most of the toxic air pollution reduction achieved to date has been due to more efficient use of existing technologies. This "first stage" pollution reduction rarely results in job loss, and often produces substantial savings. Yet even when fundamental redesign or technological changes are needed, the loss of jobs is not inherent, and can be minimized or avoided through worker input.

Process changes can also mean new jobs and often create whole new sectors of economic development. US Department of Commerce figures clearly show, for example, that environmental technology is a major economic force — and is even becoming an important export. The world market for pollution control products and services was about $370 billion last year, and the US was the largest single exporter of these products.

PROFILES

CHAPTER 4
FIGHTING SMOG

CHAPTER 5
TACKLING TOXICS

CHAPTER 6
SAVING THE OZONE LAYER

CHAPTER 7
AIR POLLUTION EDUCATION

BEST COPY AVAILABLE

CHAPTER 4

FIGHTING SMOG

*What You Should Know About...***SMOG**

More than 90 metropolitan regions in the country fail the federal standard for safe ozone levels, and more than 40 are above safe levels of carbon monoxide. (See sidebar on page 18 for the worst offenders.) What exactly *are* these two pollutants? How do they form, and what's being done to combat them?

THE DEADLY DUO: GROUND-LEVEL OZONE AND CARBON MONOXIDE

Ground-level ozone is the primary component of smog. It forms when sunlight reacts with carbon-based chemicals known as volatile organic compounds (VOCs), acting in combination with a group of pollutants called nitrogen oxides. Both groups of pollutants are emitted from motor vehicles and a variety of commercial and industrial sources; VOCs also occur naturally.

Ground-level ozone poses a serious health hazard. A recent university study established a strong link between ground-level ozone and cancer. It tracked 6,000 non-smoking Seventh-day Adventists for six years, and found that men and women living in the ozone-rich Los Angeles basin have twice the risk of getting cancer than people living in cleaner environments.

And our health isn't all we have to worry about. Ground-level ozone can harm trees, crops, and other plants. EPA estimates crop losses at $2.5 to $3 billion annually from the effects of ground-level ozone.

Carbon monoxide isn't much better. Formed primarily by incomplete fuel combustion in motor vehicles, carbon monoxide is an odorless gas that restricts the blood's ability to absorb oxygen. Among other health effects, carbon monoxide can increase the risk of heart attack in patients with angina pectoris.

Although ground-level ozone and carbon monoxide levels both tend to be highest in urban areas, their sources are somewhat different. While motor vehicles account for about 90% of the carbon monoxide pollution, they are responsible for just half of all ozone pollution. And both pollutants have seasonal fluctuations. Ozone is often a summer problem, because the sun plays an important role in its formation. Carbon monoxide, on the other hand, is largely a winter pollutant, caused by the incomplete combustion common in vehicles during the cold months of the year.

THE FEDERAL STRATEGY

Under the 1970 Clean Air Act, EPA developed a program to attack the smog problem. The Agency set National Ambient Air Quality Standards for six "criteria pollutants": ground-level ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, lead, and particulate matter. The program required each state to develop its own State Implementation Plan showing how it would meet federal clean air requirements.

Under the 1990 Clean Air Act amendments, states with polluted cities have to reduce ground-level ozone and carbon monoxide by certain dates (see sidebar on page 18). State and local air quality agencies will determine the percentage of air quality improvements to come from mobile sources (cars and trucks) vs. stationary sources (factories and businesses). The following are some specific requirements of the new law:

- Of the 100 metropolitan areas that currently violate EPA's air quality standards relating to smog, all but nine will have to comply with EPA standards by 1999. If they don't, they will automatically lose their funding for transportation projects that increase air pollution. The nine most polluted cities have up to 11 more years to comply.
- Employers of more than 100 people in the nine most polluted cities (listed as "extreme" or "severe" ozone nonattainment areas below) must reduce single occupant commutes by their workforce by 25% beginning in 1992.
- Tough new standards on tailpipe emissions will be applied to many new cars beginning in 1994, with increasingly strict standards applied in the late 1990s.
- Gasoline sold in the nine worst ozone areas must reduce toxic and smog-forming compounds 15% by 1995 and 25% by 2000.
- Oxygenated fuels that reduce carbon monoxide are required during the winter in 41 cities as of 1992.
- Thirty percent of centrally fueled fleets (e.g., buses, taxis, and delivery vehicles) will be required to run on clean fuels (natural gas, etc.) by 1998. Seventy percent must meet this requirement by the year 2000.
- Small-scale polluters like dry cleaners, printers, bakeries, and car-repair shops are required to limit their emissions that produce smog.

There are hundreds of examples of effective strategies to fight smog — many more than we could possibly describe here. Across the country, people are becoming citizen air pollution experts, officials in city hall are reviewing transportation priorities, and businesses are providing alternative commuting options to their employees. Many of these efforts have led to encouraging, even stunning, results.

Know Your Clean Air Deadline

In 1990 Congress decided to give our most polluted cities specific deadlines to comply with air quality standards, and to get tough if they didn't. Now, areas that don't meet the standards (called "nonattainment areas") are ranked according to the severity of the problem and given firm dates for meeting federal standards.

Ozone Nonattainment Areas

All but marginal ozone nonattainment areas must achieve at least a 15% reduction in volatile organic compound (VOC) emissions by 1996, followed by a 3% annual reduction until they meet the federal standard. Failure to meet interim targets results in automatic sanctions. Cities in three of the five nonattainment categories (extreme, severe, and serious) are listed below.

Extreme *(Clean Air Deadline 2010):*
Los Angeles, CA

Severe *(Clean Air Deadline 2005–2007):*
Baltimore, MD
Chicago, IL
Houston, TX
Milwaukee, WI
Muskegon, MI
New York, NY-NJ-CT
Phila., PA-NJ-DE-MD
San Diego, CA

Serious *(Clean Air Deadline 1999):*
Atlanta, GA
Bakersfield, CA
Baton Rouge, LA
Beaumont, TX
Boston, MA-NH
El Paso, TX
Fresno, CA
Hartford, CT
Huntington, WV-KY-OH
Louisville, KY-IN
Parkersburg, WV-OH
Portsmouth, NH-ME
Providence, RI
Sacramento, CA
Sheboygan, WI
Springfield, MA
Washington, DC-MD-VA
Worcester, MA

Carbon Monoxide Nonattainment Areas

The Clean Air Act amendments classify carbon monoxide nonattainment areas into two categories: moderate and serious. Areas in the "serious" category must demonstrate 5% reduction per year until they reach the target level; "moderate" areas must reach target levels five years earlier. The 52 areas of the country that currently violate carbon monoxide standards are listed below.

Serious *(Clean Air Deadline 2000):*
Los Angeles-Anaheim-Riverside, CA
New York-North NJ-Long Island, NY-NJ-CT
Spokane, WA
Steubenville-Weirton, OH-WV
Winnebago County (Oshkosh), WI

Moderate *(Clean Air Deadline 1995):*
Albuquerque, NM
Anchorage, AK
Baltimore, MD
Boston-Lawrence-Salem, MA-NH
Bremerton, WA
Chicago, IL
Cleveland-Akron-Lorain, OH
Colorado Springs, CO
Denver-Boulder, CO
Detroit, MI
El Paso, TX
Fairbanks, AK
Fort Collins-Loveland, CO
Fresno, CA
Great Falls, MT
Greely, CO
Greensboro-Winston Salem-H.Point, NC
Hartford-New Britain-Middletown, CT
Josephine County (Grants Pass), OR
Klamath County, OR
Las Vegas, NV
Manchester, NH
Medford, OR
Memphis, TN-AR-MS
Minneapolis-St. Paul, MN-WI
Missoula County, MT
Modesto, CA
Nashua, NH
Newark, NJ
Norfolk, VA
Oklahoma City, OK
Phoenix, AZ
Portland, OR
Provo-Orem, UT
Raleigh-Durheim, NC
Reno, NV
Sacramento, CA
Salt Lake City-Ogden, UT
San Diego, CA
San Francisco-Oakland-San Jose, CA
Seattle-Tacoma, WA
St. Louis, MO-IL
Syracuse, NY
Vancouver, WA
Washington, DC-MD-VA
Yakima, WA

Source: US EPA, Office of Mobile Sources, 1991.

PROFILES

- TRANSFORMING TRANSIT
- CURBING CARS
- BOOSTING BIKES
- CONTROLLING SMOG FROM STATIONARY SOURCES

TRANSFORMING TRANSIT

INNOVATIVE POLICIES CLEAN UP PORTLAND'S AIR

In the early 1970s, Portland, Oregon violated federal carbon monoxide health standards one of every three days in the year. Progressive city leaders and activists from Sensible Transportation Options for People (STOP) realized that to solve the problem, they had to get people out of their cars.

Hardly a simple task, but Portland tackled it. Perhaps the most important step was the cap on downtown parking which kicked off the smog reduction effort in 1975. With a finite amount of parking available, many workers found new ways to get to work. But limiting parking is only one piece of the puzzle. City officials also controlled car use, invested in mass transit, and got creative with transportation and urban design. Through an innovative combination of policies, Portland knocked annual carbon monoxide violations to near zero, even as the region continued to grow. (To accommodate the need for customer parking in the city center, city officials and the Clean Air Business Alliance worked out a plan in 1991 that allows downtown businesses to create new parking spots through the use of air pollution offsets.)

The "Portland Mall" is the heart of the city's mass transit system: it consists of eleven blocks in downtown Portland dedicated exclusively to buses . Built in 1978, the Mall is located in the downtown free fare zone, the first of its size in the country.

Portland's Smog Reduction

Contact: G.B. Arrington, Director
Strategic and Long Range Planning
Tri-County Metropolitan Transportation District

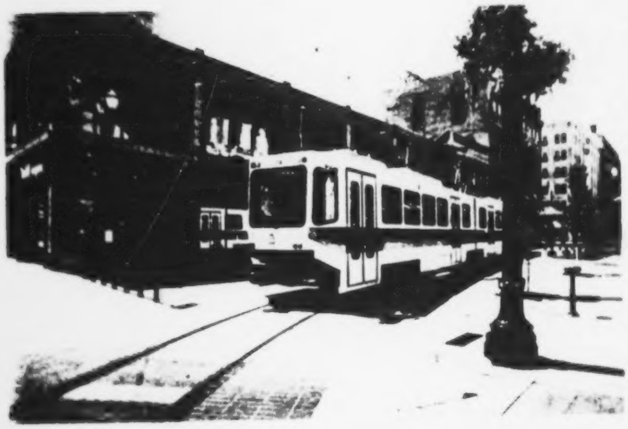
Metro Area Population: 1 million

Start up: 1975

Address: 4012 SE 17th Avenue
Portland, OR 97202

Phone: (503) 238-4977

Through an innovative combination of policies, Portland knocked annual carbon monoxide violations to near zero, even as the region continued to grow.



The MAX light rail line is part of Portland's public transit system that carries nearly half of the city's commuters to work.

Then there's the light rail system, run by the Tri-County Metropolitan Transportation District, or "Tri-Met." MAX, as the light rail line is affectionately called, runs for fifteen miles from downtown to the eastern suburb of Gresham. Using buses and MAX, Tri-Met now carries 43% of all work trips to downtown Portland.

City planners point out that MAX has been a magnet for growth, attracting concentrated development around stations. According to Tri-Met's Planning Director, G.B. Arrington, some $800 million in development has occurred along the MAX tracks since the decision to build the line, and another $400 million is planned.

Tri-Met was recently named "America's Best Large Transit Agency" by the American Public Transit Association. Why does it work so well? Beyond the parking cap, Arrington points to the city's transit-friendly policies. In 1975, the region stopped widening or building roads into downtown Portland, putting the money into mass transit instead. And Oregon's land use planning law requires an Urban Growth Boundary around every large city. This limit has dramatically reduced "urban sprawl" throughout the metropolitan area, making transit more economical to provide.

It's a complicated strategy, but Portland has pulled it off — and the results are impressive. Downtown employment has increased from 59,800 to 90,000 since the early 1970s, while annual carbon monoxide violations have plummeted to near zero. By implementing farsighted land use and public transit policies early on, Portland nipped a major air pollution and congestion nightmare in the bud.

TRANSFORMING TRANSIT

BOULDER BUS PASS OFFERS COMMUTERS REAL ALTERNATIVE

Ecopass covers all of its costs — and it gets business paying for transit.

To get people out of their cars, you've got to offer an easy and reliable alternative. The Denver Regional Transit Authority's *Ecopass* does that and more.

Developed by the Alternative Transportation Center in Boulder, Colorado, the *Ecopass* is a new and ingenious approach to alternative commuting that's getting even the most devout drivers onto the bus. The simplicity of the concept is remarkable: employers buy annual passes for *all* their employees, whether or not they ride the bus. Once a company signs up, its workers are issued photo IDs which gain them unlimited bus travel and a guaranteed ride home for all who commute via alternate modes (e.g., carpool, vanpool, transit, or bicycle).

The annually issued *Ecopass* is simpler and easier to use than other voucher programs, but "the guaranteed ride home really sells the program," says Bob Whitson, Director of Boulder's Alternative Transportation Center. The Center, a unique government agency established by the Boulder City Council to design and implement alternative transportation systems, established the *Ecopass* program in 1989. Center officials say once a company is enrolled in the program, employee bus ridership on average doubles, typically from about 5% to about 10%; sometimes it even triples. And in a recent survey, 1,000 downtown Boulder workers reported using the *Ecopass* an average of fourteen times per month. That adds up to 7,000 car trips avoided each month. And that's just the beginning: the Center expects 40,000 workers to be enrolled in the program by the end of 1994 — more than half the employees in Boulder.

The Ecopass Alternative

Contact: Bob Whitson, Director
Alternative Transportation Center

Denver/Boulder Region: 1,848,319

Start up: 1989

Address: P.O. Box 791
Boulder, CO 80306

Phone: (303) 441-4260

Once a company is enrolled in the program, employee bus ridership doubles — sometimes it even triples.

The *Ecopass* program has now spread to the six-county Denver region, where it is run by the Denver Regional Transit Authority.

But why, you might ask, would an employer buy bus passes for all its employees? There are several persuasive reasons.

- First, the *Ecopass* program is cheap, fully tax deductible for employers, and not taxed as income to employees. The *Ecopass* costs from $20 per employee *per year* for companies in outlying areas with less bus service, up to $145 per year for companies in downtown Denver, where 28% of daily commuters now ride the bus.
- Second, for employers of 100 or more people, *Ecopass* is an easy way to meet their Clean Air Act requirements to reduce single occupant commuting.
- Third, *Ecopass* is an inexpensive alternative to paying for more employee parking. By adopting *Ecopass*, companies can hire more workers without increasing neighborhood traffic and parking problems, which arouse the ire of community groups.

The program generates substantial funding for the regional transit system as well. Explains Whitson, "This method of collecting fares covers the total costs of operating, maintaining, and even expanding the *Ecopass* system. And it gets *business* paying for transit." The fact that *Ecopass* fares pay the complete cost of the program compares well to the rest of the transit system, where fares cover only 30% of costs.

Everyone in the program views *Ecopass* as a unique employee benefit that brings people to work relaxed. By making it easy to ride the bus and ensuring that nobody will get stranded without a ride home, programs like *Ecopass* build public support for better transit, rather than more roads.

Auto-Free Cities

Since 1975, Singapore has levied a fee on vehicles entering the city center — except for buses, commercial trucks, and cars carrying four or more people. The scheme is part of a package of traffic measures — including expanded bus service, heavy parking charges, and high car taxes — that has reduced congestion, traffic accidents, and further road building.

And in Geneva, Switzerland car parking is simply prohibited at workplaces in the central city. Commuters have no choice but to use the city's superb public transit system.

Source: Worldwatch Paper #98, *by Marcia Lowe.*

NEW YORK BUSINESSMAN'S VOUCHER PROGRAM BRINGS TRANSIT SUBSIDIES TO LIFE

Richard Oram saw a gap in the system. Being an innovative businessman, he decided to do what he could to fill it. The system in question was the federal government's business tax laws; the gap was translating provisions for public transit subsidies from the code books into concrete employee benefits.

Under federal tax laws, employers can add up to $21 worth of public transit use to their employee benefit package and deduct the expense on their tax forms. The subsidy is also tax-free for employees, who don't have to count it as income. But with no simple way to provide this benefit, few firms take advantage of it.

Commuter Check Services

Contact: Richard L. Oram, President
New York Commuter Check Services Corp.

Clients: 1,500 companies

Start up: 1987

Address: 248 W. 88th Street, Suite #14-C
New York, NY 10024

Phone: (212) 595-6056

Commuter Check is "a critical step toward reducing traffic congestion, improving air quality, and enhancing transit revenues."

Oram founded the New York Commuter Check Services Corporation in 1987 to make the transit subsidy work. Commuter Check buys vouchers from the transit authority and sells them to companies. Companies then give the vouchers to employees, who redeem them for transit tickets or passes. "Equalizing the competitive advantage of employer-subsidized parking is a critical step toward reducing traffic congestion, improving air quality, and enhancing transit revenues," says Oram. The plan has expanded rapidly; it now involves 1,500 employers in New York alone and has been adopted in Denver, greater Philadelphia, Milwaukee, San Francisco, and Norfolk. Ten other cities in the country are actively reviewing it.

"Commuter Check will build our ridership, revenue base, and productivity," says Joe Caruso, Marketing Director for the transit system in Milwaukee. "Our early contacts found Milwaukee employers very positive about the service, and we expect thousands of employees to quickly get this new benefit."

Free Parking: Giant Tax Loophole

Under the federal tax code, parking benefits get two big breaks: (1) they are not counted as employee income (a tax-free perk that can be worth thousands of dollars per year); and (2) employers can fully deduct parking maintenance and operating costs.

In Denver, the program attracted 3,000 new riders to the mass transit system in 1991. This means a drop in oil consumption of 450,000 gallons for the year. Jerry Eddy, Denver's Regional Transit District

(RTD) director of customer services and scheduling, explains, "It's simpler than handling the multiple steps of administering a regular RTD sales outlet within each company: with Commuter Check, the employer just purchases the vouchers and distributes them to workers. Period."

TRANSFORMING TRANSIT

MORE PROFILES...

REVERSE COMMUTING PILOT PROGRAM CARRIES WINDY CITY WORKERS OUT OF TOWN

Public transit officials in Chicago are testing a new idea: reverse commuting. The Center for Neighborhood Technology (CNT) launched a pilot project in 1990 with Chicago's METRA transit system that carries urban residents to suburban jobs. CNT is a nonprofit group established in 1978 to help people in low-income neighborhoods meet their basic needs.

Deborah Boldt, Transportation Program Manager for CNT, explains the importance of reverse commuting: "Mass transit systems are geared toward moving suburban workers to city jobs. But many manufacturing firms have moved to the suburbs in the last 20 years, leaving their workforce behind in the city." If urban workers can manage to find a job in the suburbs, they have no way to get there but by an expensive and polluting commute in their cars. CNT works with suburban employers and urban job placement organizations to match people with jobs, and then works with METRA to get more trains going the other way during commuting hours. Fifteen development agencies work with the Center on the project, and over 140 workers are participating in the pilot.

"The slavery of hours spent commuting in a car each day can no longer masquerade as freedom."

Richard Ayres,
NRDC Attorney,
from EPA Journal

As part of the education component of the program, CNT provides workers with materials comparing the cost-effectiveness of METRA and carpooling. METRA provides train service for only $47 per month, while carpool costs average $25–40 per week.

Center for Neighborhood Technology
Deborah Boldt, Transportation Program Manager
2125 West North Avenue ■ Chicago, IL 60647
(312) 278-4800

"NO FRILLS" RAIL LINE SERVES SACRAMENTO

In Sacramento, transportation officials get their money's worth. The California state capitol's light rail system cost less to build per mile ($9.7 million) than any other rail

FRIDAY
EXPRESSIONIST CLASSI
CABINET OF DR. CALIG
ACCOMPANIED LIVE BY
CLUB FOOT ORCHESTI
WATT/I-80

Common-sense design made construction and operation of Sacramento's light rail system the least expensive in the nation.

system in the nation. Opened in 1987, the Sacramento Light Rail Transit (LRT) was designed as an economical "starter line," using off-the-shelf technologies, existing right of ways, and abandoned infrastructure (e.g., unused freeway bridges) to reduce the cost per mile. The city also integrated the light rail system with an existing bus fleet to optimize service and reduce operating costs. Today it carries more than 24,000 commuters every day in a region with over a million residents. By 1996, citizens of Sacramento will enjoy two more segments of the rail line.

Sacramento Regional Transit District
Judy Warriner, Marketing Manager
P.O. Box 21110 ■ Sacramento, CA 95812-2110
(916) 648-8400

Public Rail: Cleaner, Cheaper, and Safer

Moving people by rail reduces air pollution. A trip via electrically powered subway or light rail produces 99% less hydrocarbon and carbon monoxide than the average single occupant commute. Not only that, rail is cheaper to build, moves more people, and is far safer:

- The average mile of light rail costs $10–20 million; the average mile of urban interstate highway costs $100 million.
- One rail track can move as much traffic as an 18-lane highway.
- Since Amtrak was founded in 1971, 750,000 people have died in car crashes; 63 have died in Amtrak accidents.

Source: The Coalition for New Transportation Priorities

Of the transit options, light rail is gaining ground. Heavy rail (underground, tube, metro, subway) operates on exclusive rights-of-way in tunnels or on elevated tracks, and each mile costs $70–100 million to build. Light rail (trolleys) is a much cheaper alternative that can run either on exclusive rights-of-way or with other traffic. Many cities are now pursuing light rail because it is quicker to build and less expensive.

BROAD COALITION SECURES $280 MILLION FOR PENNSYLVANIA TRANSIT

In Pennsylvania, as in many other states, highway funding is a cash cow. Budgets for other forms of transportation pale by comparison. Until 1991, public transit in the Keystone state wasn't guaranteed a cent, making Pennsylvania the only state with a major transit system with no dedicated state formula for annual transit funding. The result was devastating to the system. Between 1983 and 1990, 38% of the state's already reduced transit infrastructure — once considered one of the nation's best — was shut down.

Then Sara Nichols, Director of Environmentalists for Public Transit (EPT) of the Delaware Valley Citizens Council for Clean Air, had a vision. After studying air quality in the region, Nichols realized the primary air pollution problem was not factories, refineries, or utilities, but cars. The solution: build political support for transit system funding and revitalization. Nichols proposed transit revitalization as a point of common purpose for environmental, transit, and economic development advocates. The Southeast Pennsylvania Transit Authority bought the idea and worked with EPT to galvanize a broad coalition of environmentalists, industries, utilities, unions, and community groups to secure a $280 million annual state appropriation for transit.

With this victory under its belt, EPT now encourages other Delaware Valley environmental organizations to consider the damage automobiles do to the environment, and incorporate this awareness into their work.

Delaware Valley Citizens Council for Clean Air
Sara Nichols, Director ■ Environmentalists for Public Transit
311 South Juniper Street, Room #603 ■ Philadelphia, PA 19107
(215) 545-1832

Know Your MPO: Citizen Access to Transportation Planning

Metropolitan Planning Organizations (MPOs) were created by federal mandate in the 1960s to develop, maintain, and coordinate comprehensive regional transportation planning. The groups include local-level transportation authorities and elected officials (mayors and city council members). Under the new Clean Air Act amendments, MPOs play a central role in making sure metropolitan transportation plans conform with state clean air goals.

The Intermodal Surface Transportation Efficiency Act (ISTEA) also provides increased authority (and funding) for MPOs in metro regions with populations over 200,000. ISTEA requires that states develop multimodal transportation plans (i.e., not just highway plans) and that they be coordinated with the metro plans produced by MPOs. The Transportation Act specifically places 62.5% of the new $24 billion Surface Transportation Program (STP) under the authority of MPOs. STP funds are totally flexible; the money can be used for highways, transit, bikepaths, carpooling programs — and whatever other creative options local planners devise.

MPOs provide citizen access to the process, but their ability to transform transportation depends on both citizen involvement and government cooperation. To find out more about MPOs, call the Surface Transportation Policy Project or the Network for Efficient, Safe, and Sustainable Transportation, listed in the Resources section.

STRAPHANGERS WAGE EPIC BATTLE FOR NEW YORK TRANSIT SYSTEM

It is perhaps the ultimate environmental challenge: improve the service and conditions of the New York City transit system.

For more than a decade, the Straphangers Campaign of the New York Public Interest Research Group has done just that. Coordinating hundreds of volunteers, Straphangers has documented poor transit conditions in a series of surveys and 16 reports over eight years. The group has publicized the results in the media, increased public participation at public transit hearings, and fought to hold the line on fare increases and to prevent service cuts.

The Campaign also helped stop the expensive Westway highway project, freeing hundreds of millions of dollars for mass transit. Straphangers have also been instrumental in obtaining $14 billion to be spent on subway track improvements, and new and rehabilitated rail cars.

New York Public Interest Research Group (NYPIRG)
Joseph G. Rappaport
9 Murray Street 3rd Floor ■ New York, NY 10007
(212) 349-6460

VANS SHUTTLE WORKERS FROM DALLAS SUBURBS

Until Alex Roman came along, mass transit planners in Dallas, Texas had neglected suburban commuters. It just wasn't cost effective to add bus routes in low-density neighborhoods. Roman, a businessman, came up with a better way of moving suburbanites around town: Dallas Area Rapid Transit (DARTAbout) was established in 1989. The system provides curb-to-curb service and carries 500 riders each day in 17 passenger vans. And service isn't limited to commuters; the system operates six days a week for children, students, seniors, and the disabled.

Roman is adamant that DART services "definitely should be used in suburban areas. It's a great way to get cars off the road." DARTAbout has a fleet of 23 vans, and larger buses can be chartered for school trips, church functions, football games, or other events.

DART Suburban Services
Robert L. Smith, General Manager
315 Continental Avenue ■ Dallas, TX 75207
(214) 655-7012

AEROSPACE VANPOOLS PAVE THE WAY IN LA

The energy crisis of the 1970s convinced managers at the Aerospace Corporation that vanpooling was a good idea. The company began shuttling employees to work in 1975; sixteen years later, it carries 750 commuters to work on 65 routes every day. Passengers pay low monthly fares to cover operating costs (gas, oil, maintenance, insurance, etc.), making the program completely self-sufficient. Aerospace has proven a model example for alternative transportation in Southern California, where there are now more than 50 employer-sponsored vanpool programs.

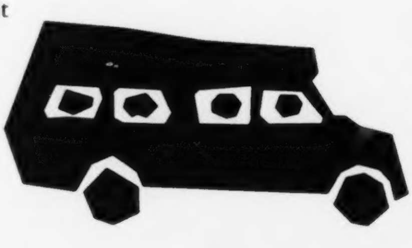
Aerospace Corp. Vanpool Program
Irv Jones, Supervisor
P.O. Box 92957 ■ Los Angeles, CA 90009-2959
(213) 336-4590

MINNESOTA VANPOOL SETS CORPORATE STANDARD

Spurred to action by the energy crisis in 1973, the Minnesota Mining and Manufacturing (3M) Company began to shuttle employees to work in six large vans. Today the company operates 114 vans and services over 1,000 employees. The program has effectively reduced gas dependency, traffic congestion, and parking problems, and company officials have documented significant environmental and economic gains. Shirley Pribnow, vanpool coordinator for the company, claims that since its inception 3M's program has "reduced vehicle miles traveled by 53,112,440, saved 3,488,400 gallons of gas, and eliminated 1,150,000 tons of air pollution." Companies throughout the country are looking to 3M's program as a state-of-the-art-model.

The 3M Company
Shirley Pribnow, Vanpool Coordinator
Building 224-1E-03 ■ St. Paul, MN 55144
(612) 736-3277

THE LA MATCHMAKER: COMMUTER COMPUTER



Commuter Transportation Services (CTS), popularly known as the Commuter Computer, is the nation's oldest and largest rideshare organization. Since it was founded in 1974, CTS has worked with more than 3,000 employers to place nearly 390,000 people in ridesharing arrangements. But CTS is more than a network for carpoolers. This private, nonprofit organization works to educate commuters about the value of transportation alternatives in reducing traffic congestion and cleaning the air. CTS emphasizes carpooling, vanpooling, busing, walking, and biking as al-

RIDESHARE
WEEK
Keep California Moving
SEPTEMBER 23-27, 1991

ternatives to driving alone.

The organization launched an annual Rideshare Week campaign in September 1991 called "Keep California Moving." The goal of the campaign was to encourage 100,000 Southern California commuters not to drive alone, and to attract 2,000 companies to informational workshops.

Commuter Transportation Services
Karl Marsh, Vice President of Client Services
3550 Wilshire Boulevard, Suite #300 ■ Los Angeles, CA 90010
(213) 380-7750

CURBING CARS

REDUCING LA SMOG WITHOUT HURTING WORKERS

Sometimes environmental rules hurt the people who can least afford it. The South Coast Air Quality Management District's famous Regulation XV, for example, forces companies with more than 100 employees to develop "trip reduction" plans to reduce single driver commuting. These laws put responsibility for cutting commuter trips in the lap of company officials — and according to Labor Community WATCHDOG, those officials often ignore the potential impact of their programs on workers.

Labor Community WATCHDOG's Transportation Amendments

Contact: Chris Mathis, Lead Organizer
The WATCHDOG Project
Labor Community Strategy Center

Air District Population: 10 million

Start up: 1989

Address: 14540 Haynes Street
Suite #200
Van Nuys, CA 91411

Phone: (818) 781-4800

WATCHDOG insists that workers should not bear the brunt of environmental regulation.

Take a company that decides to find an easy way to adhere to the law and make some money at the same time. It reduces the number of employee parking spaces and charges workers for parking spaces that used to be free. Little energy is devoted to coordinating worker carpooling, and no vans for employee vanpooling are purchased. The workers who can't pay the new parking charges are forced onto an inadequate mass transit system and spend dozens of extra hours commuting each month.

WATCHDOG, a clean air project operating out of the Labor Community Strategy Center, introduces these social justice issues to the clean air debate. In 1989, the Center organized a "Workers, Communities, and Toxics" workshop, bringing together activists from the Latino, black, labor, and environmental movements to explore the potential for multiracial coalitions in the fight against toxics. Out of this meeting, the WATCHDOG project was born.

"Laws like Regulation XV really affect the working class," explains WATCHDOG lead organizer Chris Mathis. "Some people might not have thought about that before." While some environmentalists don't pay much attention to who's not driving as long as fewer cars are on the road, WATCHDOG organizers insist that the disadvantaged should not bear the brunt of environmental regulation.

In early 1991, WATCHDOG organized a delegation of labor and community representatives to demonstrate outside the Air District's monthly meeting. Inside, members testified on behalf of their proposed Social Equity Amendment to Regulation XV. In December 1991, air quality officials approved amendments addressing many of WATCHDOG's concerns. "We got everything we asked for," says Eric Mann, Director of the Center.

Citizen Action Can Get Cars Off the Road

Businesses with more than 100 workers in the nine most polluted metropolitan regions in the country have until November 15, 1992 to develop plans to reduce single occupancy commuter trips by 25%. They have until 1998 to implement these plans. Citizens can speed up the process by pressuring businesses to implement plans sooner, and by working with their local MPO (Metropolitan Planning Organization) to push through changes like improved public transit, lane restrictions, trip reduction ordinances, parking caps, bike facilities, and ridesharing mandates.

Under the new amendments, a company must notify its workers a month before submitting a ridesharing plan, and air quality officials can disapprove plans deemed unfair to the disabled, women, minorities, or low-income workers. Workers can also appeal their company's plan to air quality officials if they're not happy with it.

Even the group's opponents admit that WATCHDOG has reshaped local debate on transportation issues. Its efforts to modify Regulation XV received extensive coverage in the Los Angeles media, as well as national press coverage. And traditional environmental organizations are developing a keen awareness of the issues of social justice implicit in transportation laws as a result of WATCHDOG's efforts.

WATCHDOG reshaped local debate on transportation issues.

The group's recent publication, *LA'S Lethal Air*, clearly outlines its views and challenges traditional environmental groups to examine their strategies from the standpoint of workers and people of color. Mathis asks rhetorically, "How can these groups be as white as they are? How can they try to organize while generally ignoring black and Hispanic groups in the area? We also want to limit air pollution of all types, but we have a different perspective than other environmental groups." WATCHDOG is currently canvassing multiracial neighborhoods to build a grassroots movement against toxic air pollution in Los Angeles County.

CURBING CARS

CONSUMER GROUP BOOSTS PUBLIC SUPPORT FOR ROCKY MOUNTAIN OXYFUELS

In 1986, Denver had the most serious carbon monoxide problem in the country. Levels were especially high in winter months, when hundreds of thousands of cold-starting vehicles cough carbon monoxide into the still mountain air.

State officials decided to go beyond programs encouraging use of mass transit and rideshare: they would change the fuels cars were running on. During the winter months, gas stations would carry "oxyfuels" which contain additives such as ethanol or a petroleum product called MTBE (methyl tertiary butyl ether). These fuels reduce carbon monoxide by enhancing fuel combustion.

Getting the program in place was the trick. Car owners weren't thrilled about having to pay slightly more at the pump, and they didn't like the idea of putting a strange new gas in their tanks.

But then people began to listen to Coloradans for Clean Air (CCA). A small, nonprofit consumer organization formed in 1986, CCA has focused on one idea: "Oxygenated fuels are the simplest, most efficient, and most cost-effective way to reduce carbon monoxide pollution." While ultimate solutions may lie in fundamental changes in our transportation and consumption habits, CCA insists that technological "fixes" such as oxyfuels are important first steps.

The group has been an important catalyst for boosting public and political support for Colorado's oxyfuel program since its inception in 1987. CCA conducts workshops for mechanics, developed a slide show for schools and civic groups, created a speakers bureau, and testifies frequently in a wide variety of public forums. "Even though we had the facts on our side, we really had to convince the public," explains Barbara Charnes, the group's Executive Director. "Otherwise, I just don't think the program would have worked." Once the oxyfuel program was in place, CCA fought for increases in the percentage of oxygenates in the fuel.

Colorado's Oxyfuel Program

Contact: Barbara Charnes
Executive Director
Coloradans for Clean Air

Impact: Statewide

Start up: 1987

Address: 1985 Grape Street
Denver, CO 80220

Phone: (303) 388-4858

"Oxygenated fuels are the simplest, most efficient, and most cost-effective way to reduce carbon monoxide pollution."

The Colorado Health Department is enthusiastic about oxyfuels. In 1991, the blended fuels program reduced tailpipe emissions of carbon monoxide by about 19%. That means the total amount of the pollutant in the air went down by 15%. If that

Cleaner Gas: A Good First Step

Evaporation of unburned fuel is a major source of smog-forming volatile organic compound (VOC) emissions, particularly in the heat of the summer. To reduce VOC emissions, California insisted that refiners reformulate their gasoline to inhibit evaporation. Inspired by the Golden State's example, eight northeastern states followed — and EPA adopted the same program in the summer of 1989.

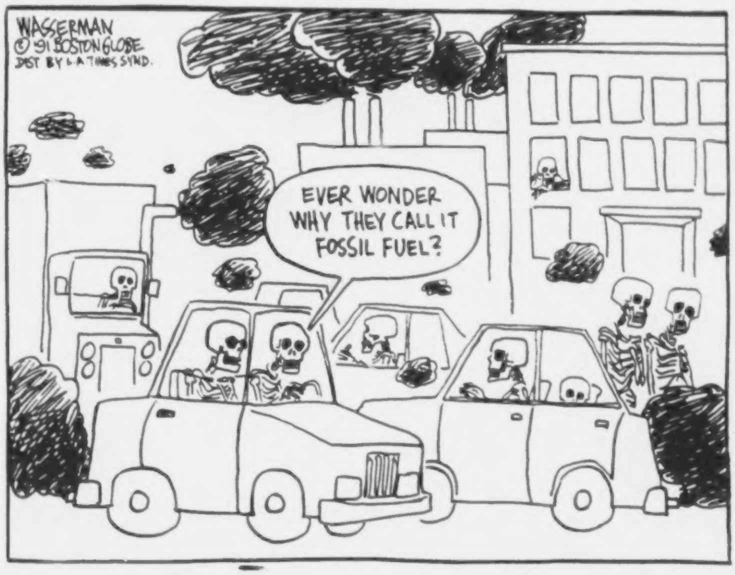
The Clean Air Act amendments require the evaporative content of gasoline to be reduced even further during summer months. And beginning in 1995, all gasoline sold year-round in the nine metro regions with the worst ozone pollution must be reformulated to reduce smog-forming VOCs and certain toxic pollutants by 15%. By the year 2000, reformulated gas in these worst polluted regions must reduce VOC and toxic emissions by 25%. Other cities are expected to join the program voluntarily, since it's a relatively easy way to reduce ozone levels.

The new amendments also expand existing oxygenated fuel programs implemented in winter months to reduce carbon monoxide pollution. By November 1992, all gasoline sold in 44 areas violating federal carbon monoxide standards will be oxygenated to improve cold weather combustion. For more information about alternative fuels, contact the groups and associations listed in the Resources section.

doesn't seem like a lot, imagine what it would take to get people to reduce their car use by by nearly one fifth. Short of forcing people out of their cars at gunpoint, it's hard to find such easy solutions to auto-driven air pollution.

Gasoline prices do inch up slightly during the winter months, but no one really complains. In 1990, for instance, the operation of the program cost the average household only $4.52. "This is really the most logical carbon monoxide reduction method. It doesn't cost very much, and it works," Charnes says.

CCA's message has not been confined to the Rockies. In 1990, the city of Denver won the US Conference of Mayors' City Livability Award, recognizing the city's comprehensive strategy to improve air quality. Charnes has worked closely with officials and citizens groups in New Mexico, Arizona, and Nevada to incorporate oxyfuels into their air pollution reduction strategies. And Colorado's success has influenced national policy as well. The 1990 Clean Air Act amendments require 44 cities — from Yakima, Washington to New York City — to use oxygenated fuels by the end of 1992.


WASSERMAN
©91 BOSTON GLOBE
DIST BY L.A TIMES SYND.
EVER WONDER WHY THEY CALL IT FOSSIL FUEL?

BEST COPY AVAILABLE

CURBING CARS

LA OIL COMPANY BUYS (AND SCRAPS) POLLUTING CARS

In the Los Angeles basin, cars account for more than half of all emissions that cause ground-level ozone. Old cars are the worst offenders.

Of the six million cars on the road in LA, 380,000 were built before 1971. Some of these clunkers emit almost 100 times as many hydrocarbons as a 1990 model, and up to 50 times as much carbon monoxide.

It was numbers like these that prompted Unocal to set up the South Coast Recycled Auto Program (SCRAP) in 1990. Unocal, a Los Angeles-based oil company, reasoned that a quick and inexpensive way to reduce pollution was to purchase and junk old cars. The company estimated that for $5 million it could buy 7,000 aged, polluting vehicles for $700 apiece. With help from the Ford Motor Company, Cypress Semiconductor, and regulatory agencies like the South Coast Air Quality Management District, Unocal raised another $1 million for the program.

Unocal's SCRAP Program

Contact: Barry Lane
Public Relations Manager
Unocal Corporation

Cars Scrapped: 8,400

Start up: 1990

Address: 1201 W. 5th Street
P.O. Box 7600
Los Angeles, CA 90051

Phone: (213) 977-7601

The SCRAP program removed 12.8 million pounds of smog-producing chemicals from the Los Angeles air.

Unocal placed ads in local papers offering $700 for pre-1971 cars in running condition that had been registered in the Los Angeles area for at least six months. These criteria ensured that the vehicles had been contributing to the region's air quality problem. The response was overwhelming; the company received more than 3,000 calls on the first day of the program and registered 1,500 cars in the first two days.

The resulting air quality improvements were even greater than expected, mostly because old car exhaust is so disgusting. Twenty percent of these jalopies had emissions so foul that they went beyond the measuring capacity of new emissions testing equipment. One car had exhaust so laden with unburned hydrocarbons that a 1990 Ford Taurus could have used it as fuel. Based on the distances the vehicles were driving — half were being driven every day, and 30% at least a few times per week — Unocal estimates that 12.8 million pounds of potential air pollution (hydrocarbons, carbon monoxide, and nitrogen oxides) were removed from the air. That's equivalent to the total emissions of 150,000 new cars.

And even though the program is not ongoing, the environmental gains were long term. Unocal surveyed 800 program participants after their cars had been scrapped: 46% reported that they had bought another vehicle, 42% were using another car, 4%

Auto-Mania: What It's Doing to Us

Since World War II, our love affair with the automobile has changed the way we live. Unfortunately, the sprawling development that the car made possible has turned this love affair into an addiction. Government policies have generously subsidized car use and have been stingy about supporting mass transit for so many years that many people are now forced to rely on cars to get to work, shop, or go to the doctor. In short, most of us need cars to survive.

To tackle air pollution from automobiles, we have enacted tailpipe emission standards: over the past two decades, individual motor vehicles have become significantly cleaner. But even though each vehicle belches less fumes, increases in total miles traveled have all but overwhelmed technological improvement. As we drive more, we pollute more. Americans now own more than twice as many cars as in 1960 and drive nearly three times as many miles. And our car use is growing faster than our population: the number of cars per capita has increased by about 60% in the past 30 years.

Cars have become such a sacrosanct symbol of our modern era and even our national identity that we seldom take a look at how they harm us. Here is some of what cars are accountable for:

Pollution. Cars are a triple threat: they are major contributors to toxic pollution, smog, and ozone depletion.

- EPA estimates that motor vehicles (car, trucks, and buses) are responsible for more than half the incidence of cancer resulting from toxic pollution. Cars account for half of these emissions.
- Cars belch out more than two thirds of the country's smog-forming chemicals.
- Automobile air conditioners are considered the largest single source of chlorofluorocarbons, the principal chemicals depleting our ozone layer.

Congestion. Americans now spend 1.5 billion hours each year stuck in traffic, and that figure is expected to triple by the year 2005. For the average person this translates into six months of his or her life waiting at red lights and two years sitting in traffic. Counting time lost, gasoline burned, freight not sold, and higher insurance premiums resulting from traffic tie-ups, the overall cost of congestion in our 39 largest metropolitan areas is estimated at $34 billion a year.

Driving Up the Trade Deficit. Over half of our multi-billion-dollar trade deficit is caused by importing oil; half of that is used to fuel our cars.

Inefficient Commuting. Two thirds of all commuting cars in the US carry only their driver to work. If we added just one person to the average vehicle occupancy rate during rush hour, we would save 30–40 million gallons of gasoline every day.

Land Use. In several of our major cities, 40% of the land mass is devoted to streets and parking lots. Ten percent of our arable land is paved, and more of our land is covered with pavement for cars than it is with housing for people; every year 100,000 Americans are uprooted to make way for more highways.

Accidents. The 2.5 million Americans killed by cars in this century is more than four times the number of Americans killed in World Wars I and II, the Korean War, and the Vietnam War combined. Ninety million of us have sustained disabling injuries from car accidents.

Taxpayer Subsidies. Every year government spends over $300 billion on highway construction and maintenance, traffic control, accident response, and lost taxes on paved land — expenditures that add up to over $2,000 a year for every car on the road.

Junkyard Waste. Cars cost us after they die as well. In a land already choking with waste, we junk nine million cars a year, along with 250 million tires and 80 million lead batteries.

BEST COPY AVAILABLE

were getting rides, and 4% were using public transportation. Most importantly, more than 80% of the replacement vehicles were 1975 models or newer, with dramatically lower emissions than pre-1971 cruisers.

The $6 million investment in Unocal's program got 8,400 polluting cars off the road. An equivalent level of pollution reduction at the company's Los Angeles refinery would cost at least $150 million, according to Barry Lane, Public Relations Manager for Unocal. "The SCRAP program highlighted the opportunity to create and utilize pollution offsets," says Lane.

The theory behind offsets is to encourage rapid air quality improvements by granting polluters flexibility to reduce the easiest sources of pollution first, while they explore the most cost-effective cleanup systems for more difficult sources in the interim. The 1990 Clean Air Act amendments allow pollution offsets for new factories or refineries. Under the law, companies in nonattainment zones can add new sources of pollution only if they "offset" the new emissions. Offsets require cutting emissions from existing sources by an amount greater than the pollution from the new source.

CURBING CARS

DENVER PROFESSOR DEVELOPS ON-ROAD TAILPIPE TEST

"It is amazing what can be seen in the infrared region of the spectrum!" Meet Donald Stedman, chemistry professor at the University of Denver. With a full beard and a British accent, Stedman will rattle on with excitement about his scientific work. And he's not alone. Across the country, people are getting excited about a new way of finding and cleaning up some of the filthiest cars on the road.

On-Road Emissions Testing

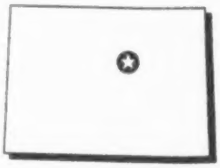
Contact: Donald H. Stedman
Atmospheric Science Center

Impact: Nationwide

Start up: 1990

Address: University of Denver
University Park
Denver, CO 80208

Phone: (303) 871-2580



Stedman's on-road testing device found that 10% of the vehicles on the road produce 50% of the carbon monoxide.

Stedman developed a way to test tailpipe emissions when cars are on the road, not in a garage hooked up to some machine. With a light source on one side of a highway on-ramp and infrared detectors and a personal computer on the other, Stedman is able to determine, remotely, the percentage of carbon monoxide in the exhaust of passing cars. He needs less than one second per vehicle. His device also records images of vehicle license plates using a freeze-frame video system; license plate information is then used to determine make and model year of the cars. A single setup can test 1,000 cars in an hour.

The most interesting result of Stedman's initial tests: less than 10% of the vehicles on the road produce more than 50% of all carbon monoxide emissions. These cars, not surprisingly, are called "gross polluters." According to Stedman, the government should focus its attention on these gross polluting vehicles. "The problem is not dirty fuels," he says, "it's dirty cars."

Stedman's device is making waves in the air pollution world because it offers a supplement to traditional inspection and maintenance programs. Such programs are operated in three dozen states, with various levels of success. Air pollution officials report a substantial amount of fraud, especially at "decentralized" programs which rely on private garages to do testing. And people with extremely polluting vehicles can sometimes fiddle with their cars to fool the inspectors during the test.

Doug Lawson of the California Air Resources Board says the best kind of emissions control program would involve both centralized annual inspection and continuous on-road testing using Stedman's device.

To help make this possible, this new inspection tool was written into the new Clean Air Act amendments, which require all areas with severe air quality problems to use on-road testing in addition to traditional inspection and maintenance programs. But some EPA officials are still reluctant to admit the potential of Stedman's invention, and observers fear the agency won't enforce this requirement.

Nonetheless, Stedman's device is on its way to revolutionizing the inspection and maintenance world; it's already been purchased by EPA, California, and Ontario, Canada. He has worked with California officials to perform several batteries of tests exploring the accuracy and feasibility of his device. And plans are in the works for the Los Angeles District Attorney's office to use the equipment to identify and pull over the worst polluters, and force them to reduce their emissions.

The device is revolutionizing the inspection and maintenance world.

CURBING CARS

MORE PROFILES...

LA COALITION FORCES VISIONARY CLEAN AIR PLAN

First Los Angeles air quality officials offered EPA a clean air plan that failed to meet both state and federal goals. Then EPA accepted it. For members of the Coalition for Clean Air, this was the end of the line. The Coalition had been fighting smog in the LA basin since the group was founded in 1970 and knew that if the *plan* didn't meet the goals, the region's air quality never would. Coalition lawyers dragged EPA to court, where federal judges ordered air quality officials to rewrite the plan.

But this was just the beginning. CCA kept the media pressure on while the plan was revised and used highly publicized "Clean Air Report Cards" to convince the California legislature that the authority of the South Coast Air Quality Management District (SCAQMD) needed to be strengthened to implement the plan effectively. The final plan is recognized as the most comprehensive, far-reaching air quality improvement plan in the nation. And the restructured SCAQMD has been called the most powerful government institution in Southern California.

The Coalition is now fighting to make the plan work. One of their current priorities is to electrify freight rail in the region, which would remove some 30 tons of diesel emissions per day.

Coalition for Clean Air
Tim Little, Executive Director
122 Lincoln Boulevard, Suite #201 ■ Venice, CA 90291
(310) 450-3190

ENVIRONMENTALISTS AND INDUSTRY GANG UP ON CAR POLLUTION IN CONNECTICUT

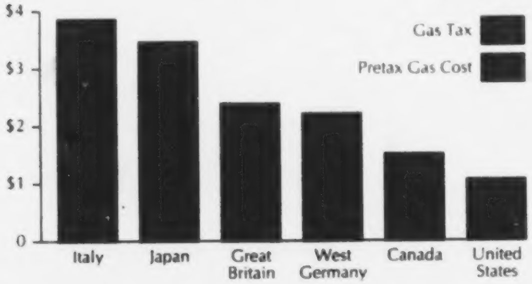
In 1990, the Connecticut Business and Industry Association invited environmental activists to discuss air pollution permits for the state's major industries. After a few meetings with little progress in sight, the process was breaking down. Then the 1990 Clean Air Act amendments came to the rescue, giving industry leaders and environmentalists something they could agree on: pollution reduction from "mobile sources," better known as cars and trucks.

The tough transportation provisions of the amendments provide a great opportunity for cooperation between businesses and environmentalists, because both parties stand to gain from tough controls on auto and truck emissions. Industry gains because it could be forced to reduce pollution from stationary sources further if mobile source controls fail to meet interim regional air quality goals. Environmentalists gain because reducing automobile use and reforming our transportation system can lead to vast improvements in air quality.

Cheap Gas: Americans Get Off Easy

Driving becomes much less attractive when gas is expensive. The Office of Technology Assessment estimates that tripling the price of gasoline could lower consumption by as much as 40%. To offset the regressive effects on the poor, lump-sum payments could be made through income taxes. Though such a measure is politically unpopular, it may be the only real way to put a significant dent in auto use.

Gasoline prices by country
relative share of gasoline taxes to total price, 1988



Graph source: Steering a New Course, *Union of Concerned Scientists, 1991.*

Says Jim Leahy of Connecticut Public Interest Research Group (ConnPIRG), "The process works because both parties want the same thing, a reduction in mobile source emissions." The scarcity of auto part manufacturers in Connecticut further eased the process. The biggest success of this unusual coalition has been the creation of a consensus for implementation of many of the Clean Air

Act's transportation sections. To date the group has presented the state legislature with resolutions supporting uniform statewide stage-two vapor recovery, enforcement of auto emission inspection and maintenance requirements, and adoption of California's tough auto emissions standards for Connecticut, the only northeastern state not yet to adopt them.

William "Bo" Holm
Pfizer Incorporated
Eastern Point Road ■ Groton, CT 06340
(203) 441-4915

MAINE ENVIRONMENTALISTS SET MODEL AIR QUALITY STANDARD, STOP HIGHWAY WIDENING

When it comes to environmental laws, progress often reflects a "trickle up" of effective strategies from below. The Natural Resources Council (NRC) of Maine provides a prime example; in 1988 the group won a lawsuit against the state that set a new air particulate standard 20% tougher than the existing federal criteria. In 1990, Maine's standard was incorporated into the federal Clean Air Act amendments, and the state gained recognition as a leader in the fight for clean air.

In 1991, NRC Maine led a broad coalition of citizens and environmentalists in a successful campaign to block the $100 million widening of 30 miles of the Maine Turnpike. This precedent-setting challenge to blacktop, concrete, and construction interests put Maine in the spotlight once again. The coalition introduced and passed a statewide referendum to:

- stop the expansion of the turnpike from two lanes to six;
- require the state to consider alternative transportation approaches before widening highways;
- make road maintenance a priority over road construction; and,
- guarantee public participation early in state transportation project planning.

Activists across the country continue to look to Maine as a model for progressive clean air policies.

"Widening roads to control congestion is like letting out your belt to control obesity."

Maine activist, from Maine Environment

Natural Resources Council of Maine
Conrad Schneider
211 State Street ■ Augusta, ME 04330-6912
(207) 622-3101

High Occupancy Vehicle (HOV) Lanes Work

People hate crowded freeways. Today, about 1% of major US freeways have lanes reserved for cars with several occupants, and studies show a significant increase in the numbers of multiple occupancy vehicles on the road when carpoolers are given a break. But HOV lanes only work when existing freeway space is converted; building additional lanes squanders precious transportation funds and encourages additional driving, rather than carpooling.

WASHINGTON STATE ATTACKS SINGLE OCCUPANT CAR TRIPS

In the Seattle metropolitan area, 90% of all peak hour trips are in single occupant cars. Not surprisingly, automobiles are the largest air polluter in the region.

To clamp down on cars, environmentalists at Clean Air Washington put together a broad-based coalition involving local governments, businesses, and citizen groups throughout the state. The Washington Clean Air Coalition convinced state legislators to pass an ambitious statewide law to reduce single occupant trips.

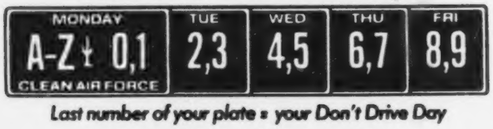
Under the law, all counties in the state with populations over 150,000 must adopt a trip reduction ordinance by October 1992. Businesses with more than 100 employees in these counties must have commuter trip reduction plans in place by the same date; local lawmakers can require plans from businesses with 50 or more employees if they are so inclined. The law set targets of 15% trip reduction by 1995, 25% by 1997, and 35% by 1999. The state goals exceed federal requirements of 25% reduction in single occupant trips by 1999. The law also establishes a 23-member task force, comprised of citizens, industries, and agencies, to facilitate implementation at the local level.

Washington Clean Air Coalition
Clean Air Washington ■ Preston Schiller
6502 106th Avenue NE ■ Kirkland, WA 98033
(206) 827-8908

PHOENIX GETS COMMUTERS OUT OF THEIR CARS

"Don't Drive One In Five" was the theme of the 1990–91 Phoenix clean air campaign. Incentives like free bus days helped the city achieve a 55% increase in daily bus ridership during the campaign; riders included community big shots like the Mayor and prominent CEOs. The supporting media effort involved 6,000 public service advertisements and approximately $750,000 in donated radio and television time. City officials documented a 6% reduction in vehicle trips during the 1990–91 winter season —

Know Your Don't Drive Day!



Last number of your plate = your Don't Drive Day

Don't Drive One In Five

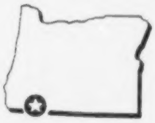
representing nearly 1,700 tons of pollution avoided.

Phoenix officials are building on their initial success for the 1991–92 campaign. During "Don't Drive Day" on November 5, 1991, the Governor and 44 prominent business leaders bused, biked, walked, or carpooled to work.

Clean Air Force Campaign
Maureen Mageau-DeCindis, Clean Air Coordinator
Regional Public Transportation Authority
302 North 1st Avenue, Suite #700 ■ Phoenix, AZ 85003
(602) 262-7242

OREGON CITY ATTRACTS TWICE AS MANY WALKERS

Good views, breezes, noise barriers, vegetation... Ashland, Oregon is renowned for its pedestrian-friendly design. Initially instituted in the town's 1985 design codes, pedestrian-sensitive development seeks to de-emphasize automobile use and encourage walkers. Planners focus on preventing large-scale development and incorporating design elements that are pleasing to pedestrians. Guidelines promote mandatory walkways to building entrances, raised sidewalks in parking lots, and canopies and awnings for protection from the weather. The 1989 "Downtown Plan" further strengthened these design requirements; downtown pedestrian traffic has doubled since implementation of the plan.



Community Development Unit Planning Department
John Fregonese, Director
20 East Main, City Hall ■ Ashland, OR 97520
(503) 488-5305

MARYLAND COUNTY REQUIRES "NO NEW TRAFFIC"

Big traffic problems call for big-time solutions. Montgomery County, Maryland, one of the nation's fastest growing counties, responded to burgeoning gridlock with one of the nation's toughest sets of traffic rules.

Under the traffic mitigation program of the Adequate Facilities Ordinance, developers must assess the impact of any new development project on traffic, and then implement measures to reduce current trips by an amount equal to the additional trips that will be caused. Building and occupancy permits are issued to developers only *after* traffic mitigation measures are in place and working. And to make the benefits last, developers must finance the measures for ten years.

Currently 55 developers are providing a range of traffic relief. Slow-growth sentiment in the county has led to a moratorium on development, placing nearly all allowable development under the mitigation program. Measures include ridesharing programs, park and ride facilities, transit subsidies, and shuttle buses.

Montgomery County's Traffic Mitigation and Zoning
Alexander Hekimian
The Maryland National-Capital Park and Planning Commission
8787 Georgia Avenue ■ Silver Spring, MD 20910-3760
(301) 495-4525

THE OIL STATE LOOKS TO NEW FUELS

Texas officials are working to cure the state's oil addiction. To improve air quality and expand the market for natural gas, the state established the Alternative Fuels Program in 1991. The new legislation mandates that all state agencies, school districts, and transit authorities eventually purchase vehicles capable of running on alternative fuels. The requirement affects over 37,000 transit buses, all state vehicles, private fleets of 25 or more, and school districts with 50 or more buses.

Program officials set ambitious phased-in goals: by 1994, 30% of affected vehicles must use alternative fuels, 50% by 1996, and if the conversion is successful, 90% by 1998. The program is expected to benefit the Texas economy by creating thousands of jobs and supporting a growing alternative fuel industry in a state that is already the world's largest producer of natural gas.

Texas Alternative Fuels Program
Soll Sussman, Supervisor of Alternative Fuels
Division of Texas General Land Office
Carlton Bell, Alternative Fuels Specialist
Stephen F. Austin Building
1700 N. Congress Avenue, Room #832 ■ Austin, TX 78701-1495
1-800-6 FUEL 99 (638-3599)

Alternative Fuels Cut Emissions

Clean-fuel vehicles that use compressed natural gas, methanol, ethanol, hydrogen, or electricity are prime candidates for local business and government innovation. The 1990 Clean Air Act amendments require the introduction of hundreds of thousands of clean-fuel cars in California beginning in 1996, and the nationwide conversion of centrally fueled fleets to clean fuels beginning in 1998. Other states can follow the California standard through a voluntary opt-in provision.

California and Texas have already gone beyond the federal clean-fuel mandate. The Los Angeles Department of Water and Power, together with Southern California Edison, has ordered 10,000 hybrid electric vehicles to be on the road by 1995. These cars will be equipped with batteries that will power them for about 60 miles, and gasoline engines to charge the batteries for longer trips. Texas, capitalizing on its natural gas resource, will require 37,000 buses and all state-owned and large fleet vehicles to be fully converted to natural gas by 1998.

BOOSTING BIKES

CALIFORNIA COMPANY CONVINCES COMMUTERS: BIKING IS BETTER

Almost everyone can ride a bike. Yet most people aren't going to start biking to work unless they get a little push.

One of the best pushers around is Roberta Holden, Transportation Coordinator for Fleetwood Enterprises, Inc. Fleetwood is bike crazy. The recreational vehicle manufacturer, based in Riverside, California, is doing just about everything to convince its employees to use bikes to commute to work. And the message is getting through.

Out of a 600-person workforce, there were only a handful of dedicated bicycle commuters when Fleetwood began its bike program a few years ago. The program was part of Fleetwood's response to Regulation XV, a California law that encourages businesses to get workers out of their cars.

With a lot of employee participation, Fleetwood set up a series of programs to promote bicycling. The company invested in several bikes to loan to workers for up to 90 days, giving them a chance to test bike commuting without a significant personal investment. Employees can then buy the bike after the loan period at a discount. Anyone who commits to ride to work three days or more per week receives a reflective vest, helmet, mirror, and a nite-lite from the company.

Fleetwood's Bike Program

Contact: Roberta L. Holden
Transportation Coordinator
Fleetwood Enterprises, Inc.

Size: 600 Employees

Start up: 1991

Address: 3125 Myers Street
P.O. Box 7638
Riverside, CA 92524

Phone: (714) 351-3500

"The key is to eliminate all the reasons people won't ride bikes to work."

But most people won't start biking to work unless they're sure it won't be a hassle. "The key is to eliminate all the reasons people won't ride bikes," explains Shelly Dobkins, an employee who has been instrumental to the success of the program. "They shouldn't have to worry about being stranded or coming to work sweaty."

So Fleetwood took steps to make pedaling hassle-free. Riders that get stuck due to an accident or flat tire can call the company's Employee Commuter Services and be picked up quickly. Fleetwood designed and installed bike lockers for easy parking and security, and provides access to a fitness center with showers in the morning. Special lockers are available for people to store up to a week's worth of outfits. There's even a maintenance facility with employee volunteers who can help with minor bike repairs.

An important part of the program is the "Fleetwood Mud, Sweat, and Gears" bike club. Club members lay out their routes on a master map, enabling riders to meet and "buddy" to and from work. They also conduct safety workshops and plan lunchtime and weekend outings. Members of the club make it known that they are available to answer questions for those who are thinking about biking to work for the first time.

FLEETWOOD

Incentives like bike lockers, free safety gear, and loaner bikes boosted the number of bike commuters at Fleetwood to ten times the national average.

Then there's Bike to Work Day, held in May. Everyone biking to work gets free pancakes cooked up by management. "It's a really good way to get people to start biking for the first time," says Holden. "It's quite a morale builder."

The time and energy put into the program have paid off. Seventy-five employees, 12% of the work force, now ride to work regularly. And the impact of the company's efforts has gone beyond Riverside. "We get a call about once a day from people throughout California asking us for more information about our program," says Holden. Why has it worked so well? One reason, according to Dobkins, is that "management has been very supportive." Many of Fleetwood's managers demonstrate that support every day when they pedal to work.

BOOSTING BIKES

MORE PROFILES...

BIKE ADVOCATES TAKE ON NEW YORK CITY

To those with vision, New York City is the perfect bicycle town. Everything is centrally located, distances are short, it is relatively flat, and cars are a proven nightmare causing pollution, congestion, and stress. Plus there's nowhere to park. Yet bicycle visionaries are a minority in the Big Apple — but perhaps not for long.

Transportation Alternatives keeps the dream alive through grassroots organizing, direct action, and lobbying City Hall. Whether defeating a proposed bike ban in midtown Manhattan or winning the right to ride over the George Washington Bridge, Transportation Alternatives mobilizes a broad coalition to fight the antibike bias of the powers that be. With the goal of creating a more peaceful, sane, and healthy urban environment, the group's members include bicycle messengers, students, professionals, dedicated biking commuters, cycling experts, new age bike junkies, and just plain folks.

The logic of Transportation Alternative's proposals is just too compelling to fade away. The group has approached city officials with plans for auto-free Central and

Bicycles: The Elegant Pollution Solution

Each person who chooses to cycle instead of driving plays a significant role in reducing air pollution. One month of commuting five miles a day by bike instead of in a car achieves the following reductions:

- ¼ lb of hydrocarbon emissions;
- 6 lbs of carbon monoxide; and
- ½ lb of nitrogen oxides.

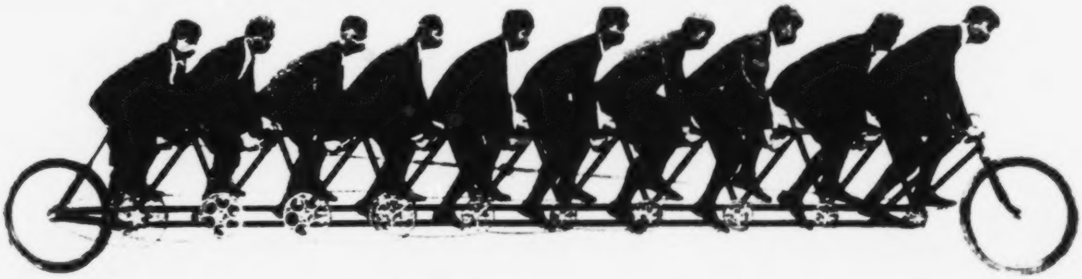
And bicycles are cheaper than cars by any measure. Providing a parking spot in an urban center can cost as much as $1,750 per year. A secure bike locker costs as little as $200 and takes up much less space. A mile of urban interstate costs about $100 million; a mile of urban bike path costs about a thousand times less.

Not surprisingly, we have some serious catching up to do in the commuters' velodrome. In the Netherlands, about 30% of work trips and 60% of school trips are made by bicycle; in Denmark, about a third of the country gets to work on two unmotorized wheels. Here we check in with a paltry 0.5% — but the numbers are growing. Cities that put time and energy into promoting and enabling bicycle use find that many people will at least give it a try, and some will make it a habit.

In Madison, Wisconsin; Eugene, Oregon; Gainesville, Florida; and Boulder, Colorado, 10% of all journeys are made by bicycle. Davis and Palo Alto, California have even higher levels; about 25% of all trips are made by bicycle, resulting in enormous air quality benefits.

What are some of the measures that pull potential pedalers out of their cars? Comprehensive, bike-friendly planning is key, and the cities that do it well build paths, set aside travel lanes for cyclists, provide amenities like parking and storage, and prepare bike route maps.

In Seattle, you can pedal 25 miles from the suburbs to downtown and almost never ride with cars, and police patrol downtown areas on mountain bikes. The bike-on-transit program in San Diego, California allows people to put bikes on buses. Several cities around the country sponsor Bike to Work days: in Boulder, Colorado, more than 500 people tried biking to work for the first time during a city-organized event. Many admitted that their respect for bicyclists increased after the experience, and a substantial number said they would try it again.



BEST COPY AVAILABLE

Prospect Parks, a Bicycle Blueprint for the city, and auto-free neighborhoods. In 1991, Transportation Alternatives hosted the First International Conference on Auto-free Cities, an overwhelming success with over 400 activists from 12 countries in attendance.

Transportation Alternatives
Jon Orcutt
494 Broadway ■ New York, NY 10012
(212) 475-4600

CALIFORNIA CITY LEADS NATION IN BICYCLE USE

Back in 1966 when officials in Davis, California wanted to paint a few bike lanes on city streets, they had to amend the state vehicle code to do it. Today, Davis leads the nation in bicycle use with 25% of all trips made on two unmotorized wheels. According to Dave Pelz, Director of Public Works, the air quality benefits are enormous. Bicycle use in Davis means that 46,000 single occupant car trips of 2.5 miles are avoided each day.

And that's not just because Davis is a flat college town. New developments are required to provide (and pay for) bike paths, street lanes, and other bicycle necessities which are incorporated in the city's transportation plan. Safety patrols treat bikes like cars to increase good will between motorized and unmotorized travellers. As a result, 36 miles of bike lanes and 24 miles of paths are currently in place.

The success of the Davis program is well recognized. Program tours have been given to officials from more than 35 states and 25 foreign countries.

City of Davis Bicycle Program
David Pelz, Director of Public Works
23 Russell Boulevard ■ Davis, CA 95616
(916) 757-5686

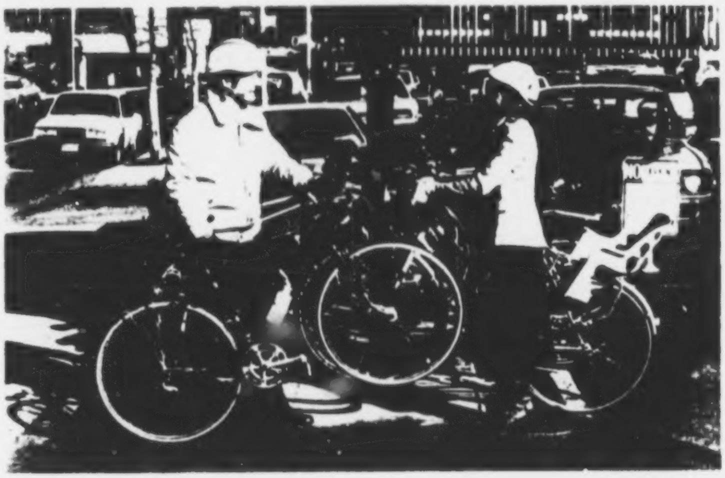
PASADENA PROMOTES PEDALING

Pedaling commuters who work for the city of Pasadena receive $40 quarterly to take care of their bike and a $20 monthly transportation allowance. To make biking even more attractive, the city government pays for lockers and showers in work sites that don't provide these necessities. If it rains, bikers can ride the bus or carpool without sacrificing their monthly stipend. The California city also lends bikes for up to three months to employees who want to try bike commuting, in hopes of converting stalwart drivers. Since the program began in 1989, 50 out of 1,600 city employees bike to work each day. With the national average less than 1% for bike ridership, Pasadena's 3% is quite an achievement.

City of Pasadena
Mike Soper ■ Pasadena City Hall
100 N. Garfield Avenue, Suite #212 ■ Pasadena, CA 91109-7215
(818) 405-4031

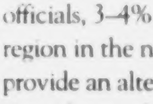
EXTENSIVE BIKEWAYS BRING NATIONAL RECOGNITION TO OREGON CITY

Eugene, Oregon boasts 45 miles of striped bicycle lanes, 19 miles of designated routes, and 23 miles of off-street paths along a river and canal. Four bicycle bridges across the Willamette River provide commuters with a safe alternative to dangerous rush hour traffic. Overall, 87 miles of bike options exist, making bicycling a common means of transportation and recreation for citizens of Eugene.



Bike-friendly planning in Eugene, Oregon encourages bicycle commuting.

Since statewide bikeway legislation was introduced in 1971, there has been considerable community participation in the yearly review and update of the state's Bikeway Master Plan. Citizen groups in Eugene help the city Bike Committee identify problem areas, review facilities, and plan and establish new bikeways. For the past two years, Eugene has been on *Bicycling Magazine's* list of the "ten best cities for cycling in North America."



Eugene Department of Public Works
Diane Bishop, Bicycle Coordinator, Transportation Division
858 Pearl Street ■ Eugene, OR 97401
(503) 687-5298

SEATTLE SETS THE PACE FOR ALTERNATIVE COMMUTING

Every day in Seattle tens of thousands of commuters pedal to work. According to city officials, 3–4% of the workers in the Seattle area — the eighth-largest metropolitan region in the nation — commute on their bikes. Over 30 miles of urban bike trails provide an alternative to automobiles in the metropolitan area, which has a population of more than two million people. Twenty-five miles of secondary trails offer local connections and loop paths for commuters.

Bike commuting has produced significant reductions in Seattle's air pollution, street congestion, energy use, and noise pollution. And because the trails are so widely used, there is extensive public support for cleanup and beautification along the routes. Bike trails have preserved and restored shoreline and inland areas, and protected habitat for wildlife.

Seattle Engineering Department
Pete Lagerwey, Bicycle/ Pedestrian Coordinator
708 Municipal Building
600 4th Avenue ■ Seattle, WA 98104-1879
(206) 684-7583

SUNSHINE STATE SPURS TWO-WHEEL COMMUTING

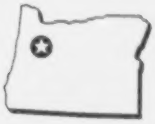
With its population growing by 1,500 new residents a day, Florida is among the fastest growing states in the country. This could mean more drivers on the road, more congestion, and more air pollution; but the Florida Energy Office is promoting an alternative vision. State officials have established a clearinghouse of information about bicycle and pedestrian opportunities and incentives. Each year since 1980, 25 local bicycle and pedestrian coordinators have ensured that funds for bikeways and sidewalks are included in city development plans. The state assigns each coordinator to a Metropolitan Planning Organization, where they work with community members and technical assistants to organize local bike advisory committees. These committees provide trail information and safety tips for riders.

Florida's Comprehensive Bicycle Plan
Florida Energy Office
2740 Centerview Drive ■ Tallahassee, FL 32399-2100
(904) 488-2475

OREGON SETS ASIDE FUNDS FOR BIKEWAYS

Oregon cruised into the spring of 1992 with a comprehensive new Bike Master Plan. Dick Unrein, Bikeway Program Manager for the State Department of Transportation, led the campaign for the plan, which calls for new foot paths, bikeways, and protected roads throughout the state. Funding for the improvements is provided by the State Highway Division; state law allocates 1% of the annual state budget to building and maintaining better bikeways and protected roads.

Oregon recently received national recognition for its efforts when it was voted one of the top "Bicycle Friendly States" in the country by the League of American Wheelmen. Unrein continues to encourage cities and counties throughout the state to develop alternative transportation plans that meet community needs. Under the 1992 Bike Master Plan, cities and counties will receive funds for local bike maps.



Oregon Department of Transportation
Dick Unrein, Bikeway Program Manager
Transportation Building Room #200 ■ Salem, OR 97310
(503) 378-3432

CONTROLLING SMOG FROM STATIONARY SOURCES

LAWSUITS, MEDIA BLITZ FORCE EMISSION REDUCTIONS IN CALIFORNIA

Marc Chytilo recently demonstrated the remarkable potential of informed grassroots activism. As the chief counsel for the Environmental Defense Center in Santa Barbara, California, Chytilo spearheaded the 1991 campaign that led Ventura County to issue the strictest rule in the nation governing nitrogen oxide emissions from a utility power plant.

Nitrogen oxide is one of the two basic ingredients of harmful ground-level ozone, and Ventura County ranks in the top ten ozone problem areas in the country. During 1990, the county violated federal health standards 55 times and failed more stringent state standards 135 days out of the year. To the elderly and those with emphysema, these are frightening statistics.

Southern California Edison, the regional utility serving Ventura County, is responsible for almost one fifth of the county's total nitrogen oxide emissions. In 1980, state officials tried to force Edison to install expensive technology to cut those emissions by 90%. Edison claimed the rule was too harsh and responded by suing both the state and Ventura County. By 1982, Edison had negotiated a court-ordered mandate requiring only a marginal reduction in nitrogen oxide releases.

Ventura County Nitrogen Oxide Law

Contact: Marc Chytilo, Chief Counsel
Environmental Defense Center
Impact: County Population — 669,016
Start up: 1991
Address: 906 Garden Street
Suite #2
Santa Barbara, CA 93101
Phone: (805) 963-1622

"Legal assistance empowers citizens groups by providing them with important legal and scientific information."

Acid Rain, Aerosols, and Haze: The Effects of Sulfur Dioxide

By now, everyone's heard about acid rain. Formed from sulfur dioxides and nitrogen oxides in the atmosphere, it's responsible for damaging aquatic life, high-elevation spruce forests, and buildings. It also contributes to mercury accumulation in fish, a serious public health problem in the Great Lakes area.

Sulfur dioxide is also harmful in other ways. First, it's lousy for your lungs. Acid aerosols, downwind derivatives of sulfur dioxide, lead to bronchitis in children and decreased lung function in adults, particularly asthmatics. Sulfur dioxide and other acids are a significant contributor to premature death associated with air pollution in urban centers.

Second, sulfates (another derivative of sulfur dioxide) are major contributors to haze in most of the country. Sulfate pollution contributes to dramatic reductions in visibility in many of our national parks, like the Grand Canyon and Virginia's Skyline Drive.

What can we do about it? About two thirds of sulfur dioxide emissions result from fuel combustion at electric power plants; sulfur in coal reacts with oxygen in the air to form sulfur dioxide. So efforts to reduce emissions have focused primarily on utilities. The 1990 Clean Air Act amendments establish a market-based program to achieve a 40% reduction of sulfur dioxide emissions (from 1980 levels) by the year 2000.

Meanwhile citizens remained angry at the county's reluctance to deal with its air pollution problem. Chytilo and the Environmental Defense Center led an aggressive legal challenge: in written briefs and presentations to local officials, Chytilo argued that the county was abdicating its regulatory responsibilities. Meanwhile, Russ and Patricia Baggerly of the Environmental Coalition of Ventura County led a high-profile publicity campaign that kept media attention focused on the case and forced local officials to respond to public demands.

With pressure from all sides, officials in Ventura County had a change of heart. According to Russ Baggerly, the county's air pollution officer became a "born again environmentalist." New county rules were passed that require Edison to install state-of-the-art "selective catalytic reduction" technology to break down 90% of its nitrogen oxide emissions into harmless nitrogen molecules and water vapor.

The new regulations had nationwide impact. For combination oil/gas-fired power plants like Edison's, selective catalytic reduction is now considered the best available technology under Clean Air Act regulations. Ultimately, the new technology will be required on all power plants of this type.

To date, other utilities have avoided selective catalytic reduction due to the expense. But the results in Ventura County are impressive. Nitrogen oxide emissions will be reduced by 2,775 tons per year at the cost of only 30 cents per month for the average household in the area. "This regulation shows what can be done to control pollution not only in the rest of the state, but in the rest of the country," explains Bill Sytle, a state air quality official.

Edison has agreed not to protest or sue the county, and Chytilo is pleased. "Public interest law firms can empower citizen groups by explaining the decision-making process, providing them with important legal and scientific information, and helping them establish a public record of their complaints," he explains. "Citizens groups supported by lawyers are often the most potent forces in environmental advocacy."

"And enforcing the law is not necessarily a money-losing proposition," continues Chytilo. "We collected substantial legal fees from EPA for successfully enforcing the Clean Air Act." Under the new Clean Air Act amendments, anyone can earn money by fighting industrial polluters. When they go into effect in a few years, citizen bounty provisions will allow those who help EPA identify illegal polluters to claim thousands of dollars in awards, in addition to attorney's fees.

The federal amendments also require local governments and states to crack down hard on nitrogen oxide emissions to reduce ground-level ozone. Southern California Edison's retrofitted system serves as a progressive example of emission reduction measures that work.

GRAND CANYON AGREEMENT SETS VISIBILITY PRECEDENT

The stunning views at many of our national parks are vanishing in the haze. On the Colorado plateau, treasures like the Grand Canyon, Bryce Canyon, and Zion National Park are often obscured by a smoggy shroud.

The Clean Air Act of 1977 protected all national parks and wilderness areas from any existing or future impairment of visibility. But EPA was slow to enforce the law. In 1982, the Environmental Defense Fund led a lawsuit against EPA for failure to enforce the visibility standards in the Grand Canyon. Sulfur dioxide emissions from the coal-fired Navajo Generating Station nearby were creating a view-destroying haze.

The legal battle dragged on for almost a decade with no end in sight until a top EPA air official visited the Grand Canyon with Grand Canyon Trust (GCT) staff in the winter of 1991. Inspired by the experience, the official convinced GCT and the Salt River Project (owner of Navajo) to come to the negotiating table. The parties

Sulfur dioxide emissions from a power station near the Grand Canyon put this view in jeopardy. Negotiations led to a 90% cut in emissions.

BEST COPY AVAILABLE

agreed that a negotiated agreement was the only way that serious pollution reduction could be achieved. "Lawsuits can get you to the table, but you need more options," says Roger Clark of GCT. "Negotiations, backed up by the threat of litigation, can mean creative solutions."

Salt River Project officials ultimately agreed to a 90% reduction in sulfur dioxide emissions at the Navajo Station by 1999. The agreement represents the first-ever enforcement of the 1977 visibility standard, and 20% more pollution reduction at 15% less cost than EPA's prenegotiation proposal. The cost to the average household served by Navajo is a meager five to 20 cents per month. Says Clark, "Even the local Rotary Club is pleased." The scrubbers and related technology will generate much needed jobs for the local economy.

The Grand Canyon Trust
Roger Clark, Director of Research and Special Projects
The Homestead
Route 4, Box 718 ■ Flagstaff, AZ 86001
(602) 774-7488

The Soy Solution to Print Pollution

Printing with soy inks is fast becoming a source reduction success story. Using inks made from soybean oil rather than petroleum can reduce emissions of volatile organic compounds (VOCs) by a substantial percentage — without compromising the quality of the product.

Oil acts as a transfer agent in ink, and when it is used VOCs are released during the drying process as the petroleum evaporates. The VOCs then react with sunlight to form ground-level ozone, the principle component of urban smog. Pure soybean oil releases no VOCs.

Inks with a substantial soybean oil content can reduce the VOC level released in printing by as much as 40%. Inks made with other oils, such as nut or linseed oil, produce similar benefits. Soy inks can also reduce ink and paper waste, since the necessary balance between ink and water can be achieved more easily. And many printers say soy ink colors are more vibrant and can be easily matched to colors achieved using petroleum oil.

Most soy-based inks currently available contain a mixture of soy oil and petroleum. The American Soybean Association reports that new technologies will soon be available that will eliminate all petroleum in soy inks used in newspaper publishing. The Association is listed in the Resources section.

CHAPTER 5

TACKLING TOXICS

*What You Should Know About...*AIR TOXICS

Acrylamide, benzene, cadmium, ethylene dibromide, styrene, trichloroethylene, and vinyl chloride... A tongue-twisting handful of the hundreds of air pollutants considered "toxic."

Only a decade ago, we were living in something of a toxics dark age. In many states, it was impossible for ordinary folks to find out how much of what pollutants a nearby factory was pouring into the surrounding air. And without hard facts, it was almost impossible for citizens to fight industrial pollution.

Now things are somewhat improved. Spurred by the horror of Union Carbide's toxic chemical release in Bhopal, India, and smaller disasters in the US, Congress passed the Emergency Planning and Community Right-to-Know Act in 1986. This law requires many industries to publicly disclose some chemical releases from certain large factories. The collection of data is known as the TRI, or Toxics Release Inventory.

Although over 90% of all toxic releases slip through the cracks of the TRI (see sidebar on page 68), the revelations are still astonishing. In the first TRI report, EPA reported that 2.6 billion pounds of toxic chemicals were released to the air from 18,000 manufacturing facilities in 1987. The 1989 report shows a slight drop in toxic emissions (most likely due to changes in reporting rather than actual emissions reductions), to 2.4 billion pounds.

THE 1990 AMENDMENTS

Concerned with the growing health risks of toxic air pollution and EPA's snail's pace in controlling these chemicals, Congress got tougher on toxics with the 1990 Clean Air Act amendments:

Setting Standards

- *For Specific Toxics.* Rather than allowing EPA to develop its list of pollutants over time, the amendments identify 189 air toxics to be controlled and set dates by which standards must be set.
- *For Industries.* EPA must develop emission standards for every type of industry that produces these toxics.
- *For Reducing Emissions.* By the year 2000, industries must reduce emissions as much as is feasible using the "Maximum Available Control Technology" (MACT).
- *For Cancer Risk.* If the cancer risk to the most exposed individual still exceeds one in one million after the MACT is in place, EPA must set standards to achieve the one in one million goal within eight years.

Almost 2/3 of the releases and transfers of carcinogens reported in 1989 went into the air.

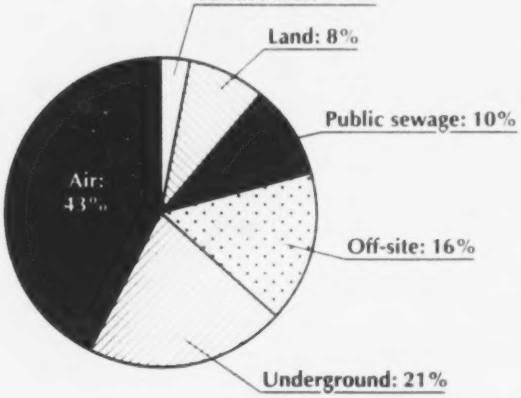
EPA, 1991

Reducing Pollution

The 1990 amendments also set specific pollution reduction standards for three sources of air toxics:

- *"Major" Sources* are stationary sources emitting more than 10 tons of one compound or 25 tons of any combination of toxics per year. Under the 1990 law, *new* facilities in this category must be as clean as the cleanest facility in their industry. Polluters in place before the law was passed must use MACT to reduce emissions until they are no dirtier than the cleanest 12% of similar facilities in the industry.
- *"Area" Sources* are smaller polluters (electroplating operations, dry cleaners, and gas stations) that were previously exempt from any regulation of toxic air emissions. These widely scattered polluters, when combined, are responsible for a can-

Where Toxics End Up



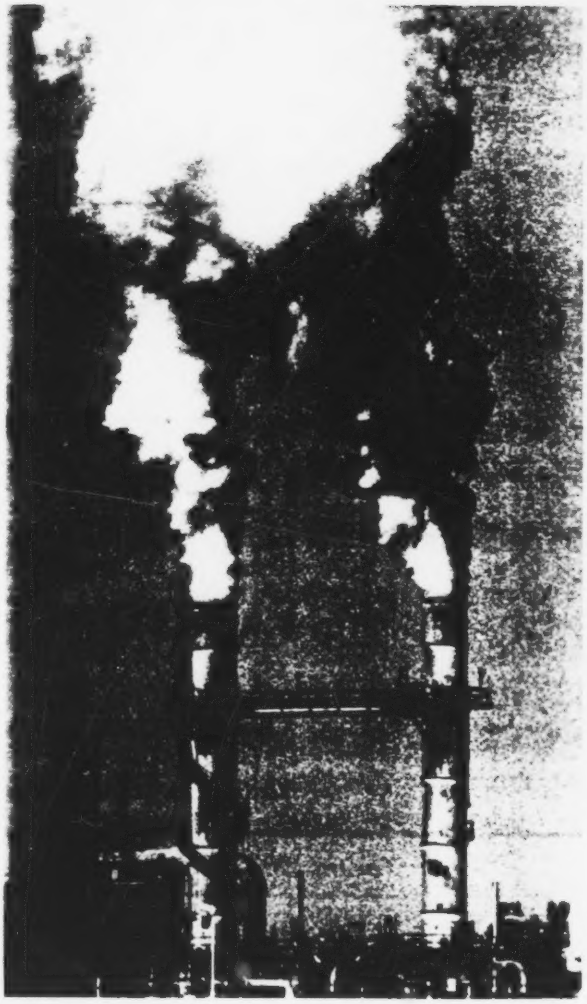
Source: US EPA, 1991.

cer risk roughly comparable to that from all major sources. Under the new law, EPA must address this risk over the next five years by:

Identifying 90% of the emissions of the 30 most important toxic air pollutants from area sources; and

Producing a strategy to reduce cancer risk from area sources by 75%.

- "*Mobile*" *sources*: the 1990 amendments begin to address toxic air emissions from motor vehicles, which account for over half of all air toxics. At a minimum, EPA must study toxic auto emissions and issue regulations for benzene and formaldehyde by the end of the decade. Reformulated fuels will also reduce some air toxics.



CITIZENS LEAD THE WAY

From Quinsigamond Village, Massachusetts to Cloverleaf, Texas, hundreds of ordinary people are banding together to defend their communities from industrial poisoning. While skeptics deride these efforts as selfish "Not in My Backyard" protests, citizens are really saying "Not in Anyone's Backyard" — and they're proving they mean it by helping other activists throughout the country.

Citizen action against toxic pollution is often also a fight for social justice. The most toxic facilities are found in the poorest neighborhoods, or those where the majority of inhabitants are people of color. Historically, these communities have lacked the resources and political clout to effectively resist industry's siting plans.

Though toxics battles are not easy to win, many communities are winning them. Citizen achievements include cutting emissions at existing facilities, shutting down the most flagrant plants, and keeping new health hazards out of communities. State and local government officials across the country are adopting air toxics, pollution prevention, and right-to-know legislation that go beyond federal requirements. And many businesses have proven that pollution prevention and toxics use reduction are economically sustainable, environmentally sound approaches to industrial management.

PROFILES

- REDUCING TOXIC EMISSIONS
- LAWS ATTACK TOXICS

REDUCING TOXIC EMISSIONS

LOW-INCOME NEIGHBORHOOD BLOCKS HOUSTON AMMONIA FACILITY

When LaRoche Industries decided in 1990 to put a 105,000-gallon ammonia storage facility in Cloverleaf, Texas, its permit application to the Texas Air Control Board let the cat out of the bag. The company argued that the Cloverleaf neighborhood was "appropriate" for the facility because it consisted mainly of "small poorly maintained houses… small junky businesses… and very low quality housing."

Texans United in Cloverleaf

Contact: Sandy Mayeaux
Texans United

Membership: 60,000

Start up: 1989

Address: 12655 Wood Forest
Suite #711
Houston, TX 77015

Phone: (713) 453-0853

"When the Air Control Board officials looked around the hall, they knew they'd walked into a hornet's nest of organized opposition."

This reasoning did not sit well with the blue-collar, multiethnic residents of Cloverleaf, which lies just east of Houston. Residents wanted to know why La Roche considered it more "appropriate" for them to bear the risks of housing huge quantities of flammable ammonia than their higher-salaried neighbors. Their worries about the storage tanks were heightened by an accident that had taken place a few months earlier: a 3,000-gallon ammonia tanker had crashed and ruptured on a Houston freeway, killing seven people, hospitalizing 50, and requiring the evacuation of more than 1,000 others.

At the first community meeting attended by the Texas Air Control Board, residents and activists from the environmental group called Texans United hung posters showing enlarged reproductions of the offensive language in the permit application.

"The Air Control Board officials flew into our first meeting expecting to smooth things over with a few fearful homeowners," remembers one of the community's leaders, Karla Land. "But when they looked around the hall and saw those posters, they knew they'd walked into a hornet's nest of organized opposition. The Board seemed a little stunned, promised to consider our objections, then headed back to Austin."

The community held a second meeting, inviting LaRoche and the Air Board to meet with residents, school board members, and state and county officials. The residents received a welcome surprise when Land stood up to read a letter to LaRoche from the Air Board's permitting engineer, which stated: "I have determined that the facility has an unreasonable potential to emit large quantities of ammonia. A large number of individuals in the immediate area would be adversely affected by accidental release. Based on the information submitted to date, my recommendation would be that the application be denied." The Air Board accepted its engineer's recommendation, and a Board official later admitted that this was the first time the Air Board had ever denied a permit application.

LaRoche also sent a letter to community leaders in Cloverleaf, informing them of its decision to look elsewhere for their storage tank site. While residents were relieved, many expressed concern about the risks the tank would eventually pose in some other neighborhood. Some Cloverleaf residents decided to act on their concern, and they now volunteer for Texans United to help provide resources and organizing assistance to other low-income communities in the state.

LaRoche argued that Cloverleaf was "appropriate" for the ammonia facility.

REDUCING TOXIC EMISSIONS

HOUSTON CITIZENS NEGOTIATE WITH GIANT OIL COMPANY AND WIN TOXIC REDUCTIONS

Environmental activists in the Lone Star state have their work cut out for them. Industries in Texas report releases of more toxics into the air than in any other state — close to 800 million pounds in 1989. That's 67% more than Louisiana, the number two state. And petrochemical companies have long been a powerful force in the Texas economy.

But George Smith and his colleagues in GHASP (Galveston-Houston Association for Smog Prevention) have found a way to fight back.

GHASP is a coalition of clean air activists in the Houston area. It includes both individual members and representatives of groups like Sierra Club, Audubon Society, and the Houston Outdoor Nature Club. GHASP focuses its efforts on the permitting process and has been involved in dozens of permitting battles, intervening when it believes a company poses an unreasonable risk to a community in the area. "We try to pick the fruits that look juiciest," Smith explains.

"We try to pick the fruits that look juiciest."

George Smith,
GHASP

Galveston-Houston Association for Smog Prevention

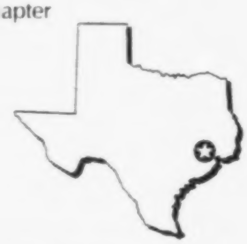
Contact: George Smith, Chair
Air Quality Committee
Sierra Club, Lone Star Chapter

Membership: 2,000

Start up: 1990

Address: 6014 Woodbrook
Houston, TX 77008

Phone: (713) 862-1669



"Our involvement puts companies on notice: they can't slide by with incomplete permits or insufficient pollution controls."

For example, when an ARCO petrochemical plant announced a major expansion that would dramatically increase benzene vapor emissions in the Channelview neighborhood, GHASP swung into action. Benzene is highly carcinogenic, causes leukemia, and short-term high doses can kill you.

Examining the permit application, GHASP questioned whether ARCO was meeting state regulations, which required the use of the best pollution control technology available. Information from an anonymous consultant provided evidence for GHASP's claim that ARCO had underestimated emission levels and failed to include sufficient pollution reduction measures in its permit application.

When it appeared that GHASP's complaints about the application might force the Texas Air Control Board to hold a public hearing, ARCO decided to avoid further delays in the permitting process and began direct negotiations with GHASP that produced dramatic changes in three important areas:

- *Pollution Reduction*. ARCO agreed to significant pollution control measures: installing hydrocarbon scrubbers, using vapor recovery for barge loading, improving benzene tank seals, and implementing a better wastewater discharge process. None of these steps had been included in the original permit. The result? Benzene emissions of more than 20 tons per year were avoided. That's a lot of carcinogenic pollution people in the area won't have to breathe.
- *Citizen Involvement*. Channelview residents are more involved in air toxics issues in the wake of GHASP's success. Residents were not actively involved in GHASP's negotiations with ARCO, in part because they did not want to be viewed as anticompany, and in part because some citizens were preoccupied with

Citizens in Court: How to Sue Polluters

Any citizen can sue owners and operators of facilities that do not properly report toxic releases under the Emergency Planning and Community Right-to-Know Act. Fines can be up to $25,000 per chemical not reported, per day.

The Working Group on Community Right-to-Know, a network of activists promoting citizen access to information about toxic pollution, offers guidelines for effective legal action under the Act. The group's pamphlet , "Ten Steps to Better Enforcement," walks citizens through the daunting legal maze, providing advice on "Defining Your Target," making sense of state agency files, and generating media coverage. Contact the Working Group for more information at (202) 546-9707.

Source: Working Notes on Community Right-to-Know, *October 1990.*

battling an incinerator in the area. But after negotiating with GHASP, ARCO decided to encourage more citizen input. ARCO and another company in the area asked GHASP to help set up a citizens advisory panel involving local residents; residents have responded enthusiastically to the opportunity to keep formal tabs on the companies in their area.

- *Stricter Standards*. GHASP convinced the Air Control Board to use a more accurate way to estimate hydrocarbon evaporation from petrochemical plants — a step Smith believes will be indispensable to similar fights in the future. "When other plants of this type are applying for a permit, it will be much easier now to convince them to install leakless valves," says Smith.

"There are two ways for citizens to make a difference in Texas," Smith continues. "First, they should contest permits and negotiate with companies to provide for reductions. Second, they should complain to the Air Control Board. Our involvement in the permitting process puts the Texas Air Control Board and companies out there on notice: they can't slide by with incomplete permits or insufficient control technology."

Though not infallible and hardly easy, the strategy of intervening in the permit process can work — and is spreading. GHASP frequently gets calls from other citizens groups around the country. Smith notes, "We can't fight their battles for them, but we can provide advice on effectively intervening in the permitting process."

REDUCING TOXIC EMISSIONS

IOWA COMPANY APPROACHES ZERO EMISSIONS GOAL

"The first 80% is easy — it's the last 20% that's tough," explains Dennis Swanson, pollution prevention specialist for Fisher Controls International. He's describing his experience coordinating Fisher's 100% waste elimination program. Based in Marshalltown, Iowa, Fisher produces industrial valves, regulators, and control instrumentation. A few years ago, the company decided to reduce its impact on the environment — to zero.

"The Marshalltown plan is working because we believe our goals of zero discharge and zero emissions are ob-

Fisher Controls' Pollution Elimination

Contact: Dennis Swanson, Pollution Prevention Specialist
Fisher Controls International

Size: 2,000 Employees

Start up: 1987

Address: 205 South Center Street
Marshalltown, IA 50158

Phone: (515) 754-3011

"The Marshalltown plan is working because we believe our goals of zero discharge and zero emissions are obtainable."

tainable," Swanson says. When the program got off the ground in 1987, the company's facilities in Marshalltown annually released more than 100,000 pounds of air toxics, produced over a 870,000 pounds of hazardous waste, and shipped more than 1,400 tons of garbage to the local landfill. The principal air toxics released were xylene, toluene, and a chemical called 1,1,1 trichloroethane. By 1991 Fisher reduced air emissions of these compounds by 80%, slashed hazardous waste by 90%, and cut garbage going to the landfill to half of its previous volume.

Industry is starting to realize that waste minimization improves profits.

How did such startling progress come about? The company formed eight environmental committees, giving each a specific waste minimization task. By the end of 1990, most committees had accomplished their mission. Solutions ranged from simple conservation measures to significant process changes.

An example: Solvents used by Fisher to clean machine parts were evaporating into the air, producing toxic emissions. The company introduced an entirely new cleaning process; now parts are cleaned with soap and water, and the rinse water is recovered, filtered, and reused.

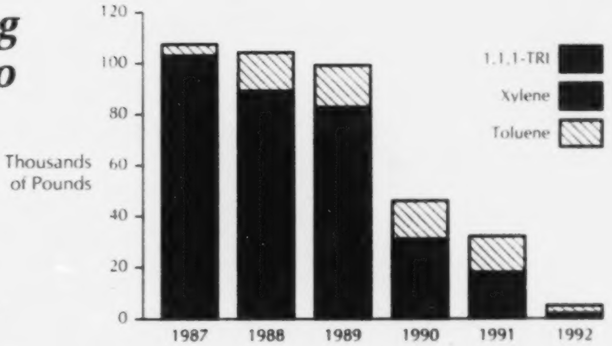
Some solutions were even simpler. Oil that leaked from equipment in the machine shop (which covers a ten-acre area) used to be sopped up with "Floor Dry," an absorbent material. Oil-soaked Floor Dry contributed 235,000 pounds to the company's hazardous waste stream in 1987. The first step in eliminating this waste was fixing leaks to reduce the amount of oil on the floor. The remaining waste oil is cleaned up with a mop and bucket. Oil is then separated from the mop water and recycled, and the remaining rinsewater is clean enough to dump down the drain.

All the projects implemented to date have saved money. Overall savings of $1.4 million per year are expected by the end of 1992. These kinds of figures are bound to attract some serious attention. "Industry is starting to come around and realize that waste minimization does affect profits," says Swanson.

Fisher's efforts have gotten the attention of state officials as well. The company recently received the Iowa Waste Reduction Award and the Iowa Energy Leadership Award for its waste elimination efforts. Swanson is getting calls from companies across the country that are interested in Fisher's program.

Now Fisher faces that final, tough 20% reduction to reach its waste elimination goals. To do so, it has to move beyond simple solutions to some serious innovations. The environmental committees have been replaced by a new policy encouraging individual waste reduction ideas that could apply to the whole plant. Swanson believes that widespread employee participation has produced a "cultural" change within the company supporting a "zero waste mentality." To reinforce this shift, Fisher has adopted a new company motto: "Innovation is fashionable, waste is not."

Getting to Zero



Source: Fisher Controls Int'l.

REDUCING TOXIC EMISSIONS

IOWA FOUNDRY ELIMINATES DANGEROUS EMISSIONS

Randall McDougall decided enough was enough. As head of environmental compliance at the John Deere Foundry in Waterloo, Iowa, he didn't like what he saw. The foundry was releasing more than 700,000 pounds a year of methyl chloroform, a toxic solvent used in manufacturing engine cylinder heads and similar components.

McDougall didn't know that methyl chloroform would soon become renown for its potential to destroy the ozone layer. He simply believed the foundry ought to find a way to stop spewing out so many tons of fumes. "Releasing that quantity of hazardous materials just didn't make any sense," he explains now.

Methyl chloroform was used to rinse the cores of casting assemblies producing metal equipment. McDougall initiated a study process in the foundry to examine alternatives. First foundry officials looked at capturing and recycling the methyl chloroform, but decided that this would result in only 90% efficiency. An annual release of about 70,000 pounds of methyl chloroform would continue.

John Deere Foundry

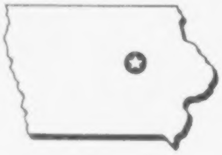
Contact: Randall McDougall

Size: 1,000 Employees

Start up: 1989

Address: P.O. Box 2000
Waterloo, IA 50704

Phone: (319) 292-5490



"Releasing that quantity of hazardous materials just didn't make any sense."

McDougall wanted the company to eliminate methyl chloroform entirely. The foundry soon found the solution: an alternative casting process which required no rinsing. It reduced emissions and saved money at the same time. According to one company official, John Deere is now saving $380,000 in annual production costs.

McDougall's efforts recently won the foundry the second annual Iowa Waste Reduction Award. John Konefes of the Iowa Waste Reduction Center speaks highly of McDougall's record at John Deere, "one of the more conscientious companies we've found."

The switch from methyl chloroform reduced emissions and saved money.

REDUCING TOXIC EMISSIONS

MORE PROFILES...

CITIZEN NEGOTIATORS REDUCE CHEVRON EMISSIONS IN CALIFORNIA

"An organized community gets results."

Henry Clark,
West County
Toxics Coalition

What do you do when a major Chevron refinery and chemical plant is your neighbor? "Organize," says Henry Clark, Director of the West County Toxics Coalition. West County members use door-to-door canvassing and media campaigns to fight toxic emissions from the sprawling facility. Their first victory: the right to negotiate directly with Chevron officials. Negotiations led to a chlorine phaseout, a relocation of several ammonia storage tanks, and a community-wide early warning system for disasters. "An organized community," Clark concludes, "gets results."

But the battle never ends. In December 1991, a breakdown in one of Chevron's catalytic cracking units released nickel and vanadium into the community's air. Residents are demanding compensation for the health effects of the emissions, which ranged from rashes to respiratory difficulties. They say they are prepared to use whatever measures necessary — demonstrations, letter campaigns, or boycotts — to receive just compensation.

West County Toxics Coalition
Henry Clark, Executive Director
1019 MacDonald Avenue ■ Richmond, CA 94801
(415) 232-3427

VIDEO TAPE STOPS COKE OVEN POLLUTION IN DETROIT

"I don't know how people sleep at night," says Detroit resident Brenda LiveOak, "knowing how the poor people in this city — and all over the country, for that matter — suffer from environmental pollution." LiveOak, a field engineer for a Detroit computer company, has transformed her sleepless nights into creative problem solving. She founded the Oakwood Environmental Concern Association (OECA) ten years ago, and has been working with leaders in low-income neighborhoods to fight pollution ever since. The people of southwest Detroit call her the "Environmental Evangelist."

Most recently, LiveOak's group shut down a polluting coke oven. (Coke ovens transform coal into higher grade fuel for steel mill use.) The facility, owned by the Detroit Coke Company, had been releasing benzene, particulates, and hydrogen sulfide (among other chemicals) into the city's air for more than a decade when OECA began its cleanup campaign in 1990. First LiveOak's group got the company slapped with an "administrative consent" order, requiring them to bring the coke oven into line with state and federal air pollution rules. But the facility continued to operate for another year and a half with no sign of improvement — and no enforcement of the consent order by county air quality officials. Eventually, pressure from OECA convinced county officials to levy a $5,000 per day fine on Detroit Coke for failing to install pollution control equipment. Still the emissions continued.

So LiveOak set out to document the violations herself, videotape in hand and pollution expert from the American Lung Association (ALA) of Michigan in tow. Financial help from the ALA allowed LiveOak to make 18 copies of the video and distribute them to EPA officials, members of the Michigan Air Pollution Control Commission, and the Governor. "A video camera is a very valuable tool for documenting opacity violations," explains LiveOak. "Opacity" is a measure of what can be seen through a pollution plume; specific percentage opacity must be reached under Michigan's air pollution regulations.

The video evidence convinced members of the Air Pollution Control Commission to take action. In the summer of 1991, they gave Detroit Coke two months to come into full compliance. The company voluntarily shut down two days after the ruling.

According to LiveOak, the owners had no intention of ever making improvements and had planned to "run the plant into the ground," at the expense of worker safety. A large number of workers had already been laid off by the time the plant closed. Of the 150 workers who remained, some transferred to another plant, some received early retirement benefits, and some negotiated severance packages.

"The owners had no intention of ever making improvements."

Brenda LiveOak, Oakwood Environmental Concern Association

Oakwood Environmental Concern Association
Brenda LiveOak
2216 College Road ■ Lincoln Park, MI 48146
(313) 386-1496

CANCER DEATHS NEAR CHEMICAL COMPLEX SPUR KENTUCKY WATCHDOG GROUP

The loss of two close friends to cancer prompted Corinne Whitehead to form the Coalition for Health Concern (CHC) in 1985. The group, based in Calvert City, Kentucky, documented and mapped cancer cases to raise community awareness. It also monitors local, state, and federal environmental officials to be sure they enforce the law. Whitehead points to carcinogenic emissions from the chemical complex — which she claims are among the highest levels in the country — to explain the county's skyrocketing cancer rates.

Support from national organizations like Greenpeace helped the group conduct an effective education campaign to motivate citizens of Calvert City. The resulting

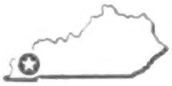
BFGoodrich

Citizens mapped cancer cases in Calvert City, Kentucky to convince officials to install toxic emissions monitors on local plants.

71 BEST COPY AVAILABLE

pressure led EPA and the state of Kentucky to install toxic air monitors at seven facilities in the Calvert City area. CHC is also pushing company officials in the chemical complex in Calvert City to reduce toxic emissions from their plants.

According to Whitehead, local industries are "finally beginning to clean up their act." A comprehensive study of toxic contamination in the area is currently being conducted by EPA, the Tennessee Valley Authority, the US Geological Survey, and the state of Kentucky. CHC is also working to shut down Calvert City's hazardous waste incinerator and to encourage the cleanup of radioactive and hazardous contaminants at nearby sites.



Coalition for Health Concern
Corinne Whitehead
Route 9, Box 25 ■ Benton, KY 42025
(502) 527-1217

GULF COAST SOCIAL JUSTICE GROUP TAKES ON ENVIRONMENTAL FOCUS

Established in 1981 to raise money for social programs, the Gulf Coast Tenants Leadership Development Project (GCTLDP) shifted its focus to air and water quality when members realized the inequitable distribution of pollution on residents of low-income communities. By the late 1980s, the Louisiana group had evolved into a full-fledged environmental organization.

GCTLDP's mission is to educate and agitate.

GCTLDP works to educate communities and encourages residents to take political control of their environment. It teaches people to question the role of industry in their neighborhood, and helps community leaders find and use government and other appropriate resources (e.g., Toxic Release Inventory data). The group organized the Great Louisiana Toxics March in 1990 to publicize the state's high levels of toxic releases. More than 2,000 Louisiana citizens marched from New Orleans to Baton Rouge, attracting national media attention.

Increased awareness resulting from the project's efforts has led many community groups to file and win lawsuits against local industries demanding plant shutdowns, relocations, or monetary compensation for lost value of contaminated real estate. One community recently won several million dollars from factory owners to finance the relocation of an entire community. Members of GCTLDP describe their mission as an effort to "educate and agitate" poor communities to question the effects of industrial pollution on their quality of life.

Gulf Coast Tenants Leadership Development Project
Pat Bryant
P.O. Box 56101 ■ New Orleans, LA 70156
(504) 949-4919

NEIGHBORHOOD ACTIVISTS REDUCE PLASTICS PLANT EMISSIONS IN MASSACHUSETTS

Citizens in Quinsigamond Village were tired of breathing toxic fumes from the local plastics plant. In 1987, they began a year-long struggle to convince the Lewcott Company, which had been in the city for decades, to clean up its act or move the plant out of the neighborhood. Members of Quinsigamond Village Health Awareness Group investigated the company's environmental records, compiled a health survey, and picketed the company with angry signs ("Don't ruin our summer again" and "Lewcott get out!").

The pressure brought Lewcott officials to the negotiating table, where they agreed to adopt more effective pollution controls and update their emission standards. Instead of implementing the changes in two plants, however, Lewcott consolidated its operations into a single clean facility in Millbury, and most Quinsigamond employees transferred to the Millbury plant. The American Linen Company took over Lewcott's Quinsigamond plant, providing additional jobs in the community. Officials from American Linen say they use strictly clean-burning natural gas in their boilers and driers.

Quinsigamond Village Health Awareness Group
Cindy Phillips
c/o 50 Southold Road ■ Worcester, MA 01607
(508) 756-0605

AKRON STORAGE TANK ACCIDENT PROMPTS TOXIC REDUCTION PLEDGE

Residents of Akron, Ohio swung into action in February, 1989 after a train derailed and caught fire near B.F. Goodrich storage tanks holding toxic and flammable chemicals. Though no damage to the tanks occurred, local politicians and community groups were alarmed by the potential environmental, health, and safety risks.

The story hit the front page of the *Akron-Beacon Journal* and prompted City Council and fire department officials, reporters, university students, and members of the environmental group Citizen Action to tour the Goodrich plant. Armed with the Toxics Release Inventory, which lists Goodrich as the largest air toxics polluter in the county, Citizen Action and local residents pushed the plant to commit to a 70% reduction of toxic emissions over a three-year period. Company officials pledge they are "well on their way" to achieving that goal.

Akron Citizen Action
Richard Swirsky, Program Director
80 West Center Room L101 ■ Akron, OH 44308
(216) 375-5277

Incinerators Mean Dirty Air and More Trash

More than 100 municipal waste incinerators currently operate in the US, with another 200 facilities planned or under construction. EPA regulations adopted in 1990 require new and existing facilities to install scrubbers and other air-pollution controls that will reduce dioxins and other toxics (furans, lead, cadmium, arsenic and chromium) by as much as 99%.

This is an important step, but the basic problems with incineration remain unresolved. The Environmental Research Foundation points out that even when waste incinerators *are* operating at 99.99% efficiency (which is rare), an average-sized facility will release 7,000 pounds of unburned wastes into the air each day. The ash that remains — from both hazardous and municipal incinerators — contains concentrated toxics, which raises concerns about dumps filled with toxic incinerator ash. Incinerators also create financial incentives to burn, which diverts materials that could be recycled and undercuts the growth of recycling and waste reduction programs.

CITIZENS PUT THE HEAT ON MIAMI INCINERATOR, GET A CLEANER BURN

Local residents call it "The Miami Monster." Edmund Benson saw the solid waste incinerator in Dade County as a threat to health and property values in his community, and he decided to do something about it. Benson, a retired carpenter, founded ARISE in 1986 to push for reductions in particulate and toxic emissions from the incinerator. ARISE organized high-profile protest marches, collected thousands of signatures on petitions to local legislators calling for emission reductions, and rented planes and helicopters to take aerial photos of the facility's pollution plume.

Community pressure led the county to undertake an $80 million plant rehabilitation, installing state-of-the-art pollution control technology. Benson is pleased with the progress — and the significant drop in emissions and odors, though he admits the facility will "never be as clean as old McArthur's milk operation." ARISE is now focusing on a comprehensive pollution reduction program for Dade County. Benson founded "Enviro-Cops" in 1991, a network of more than 14,000 students working to prevent pollution and reduce waste.

"SEE MIAMI LIKE A NATIVE"

ARISE
Edmund F. Benson, Founder
4001 Edmund F. Benson Boulevard ■ Miami, FL 33178-2384
(305) 592-7473 ■ (59ARISE)

LAWS ATTACK TOXICS

MAINE TOWN ADOPTS ENVIRONMENTAL LAW OVER PAPER COMPANY OBJECTIONS

The first leak from the local paper mill sent 4,000 of Jay's 5,000 residents scrambling for cover. The second spill, deemed a "nonevent" by a spokesman for International Paper Company which owns the mill, left a cloud of green chlorine dioxide gas settling over the community.

These events of the spring of 1987 brought environmental issues home to the citizens of Jay. Concerned residents and members of the local labor union formed a committee and asked their town attorney what they could do. "We were sick and tired of people in Augusta and Washington telling us everything was OK," says active committee member Gary McGrane, "when we weren't so sure that it was."

Jay's Environmental Ordinance

Contact: Gary McGrane, Treasurer
United Paper Workers International
Local 14

Town Population: 5,000

Start up: 1987

Address: P.O. Box 272
Jay, ME 04239

Phone: (207) 897-5423

"We were sick and tired of people in Augusta and Washington telling us everything was OK, when we weren't so sure that it was."

The pulping and bleaching process used to make white paper creates hundreds of chlorinated chemical compounds. Many of these chemicals have never been studied; some of those that have (like chloroform and benzene) are known to cause cancer. A study for Environment Ontario found that the average North American pulp mill produces between 70,000 and 100,000 pounds of chlorinated compounds each day. (Less than 2% of that figure, or just under 1,400 pounds per facility per day, were reported under the 1989 federal Toxics Release Inventory.)

Citizen pressure prompted Jay officials to commission a study evaluating International Paper Company's environmental record. The results took local leaders by surprise. Town Manager Charles Noonan told local reporters he was "overwhelmed at the amount of air emissions violations, with little or no enforcement."

The citizens committee took the study as proof that the town couldn't rely on overburdened state and federal agencies for enforcement. The group worked with their town attorney to draw up a comprehensive environmental ordinance that would shift responsibility for regulating local polluters to town officials.

When the ordinance passed in the spring of 1988, local officials hired a code enforcement manager to monitor and license industrial polluters in the area. The town began to issue its own schedules of compliance, monitor operations and emissions from local industries, and collect fines when the rules were broken.

International Paper Company (IPC) opposed the measure vehemently and claimed that it was the product of political pressure from labor leaders who were on strike against the company. Company officials posted fliers and paid for newspaper advertisements warning Jay residents that the ordinance threatened the town's economic future.

Getting a Leg Up on the Feds

The federal Clean Air Act amendments explicitly authorize state and local governments to pass laws controlling air pollution that are more stringent than federal requirements.

Noonan insisted the strike was irrelevant to the adoption of the environmental law. "They polluted before the strike, they've polluted during the strike, and I would guess they will pollute after the strike is over," he maintained.

The company filed a law suit in Federal District Court, arguing that the local ordinance was unnecessary and burdensome. Because IPC pays nearly 80% of the town's revenues, it was also paying 80% of the town's cost to defend itself against the company. When the Federal District Court upheld Jay's law, International Paper decided not to appeal the case. "I guess they got tired of paying for both sides of the fight," concludes McGrane, who is Treasurer of United Paper Workers International, Local 14.

Bill Meserve, President of Local 14, says the paper company has cleaned up its act since the environmental law passed. "They're no longer on the honor system," he explains. "Officials used to send emissions figures to the state each quarter, and the state would just believe them. Now the town has the right to go out and check those numbers."

"The mills are no longer on the honor system."

Bill Meserve, UPWI, Local 14

The ordinance is the only one of its kind in Maine and has attracted the attention of environmental organizations throughout the state. McGrane believes this kind of networking is essential: "If we're communicating with all the groups in the state, we can learn from each other and speak with one voice. And if we speak with one voice, we'll have more clout in Augusta and Washington, D.C."

LAWS ATTACK TOXICS

CALIFORNIA ENACTS TOUGH REPORTING REQUIREMENTS

In California, people will soon know the health risks of living next to a factory. The state's Toxic Hot Spots law requires companies that release toxic chemicals to tell their neighbors all about it: not only how much of what is released, but also what those emissions will do to their health.

The California legislature passed the Toxic Hot Spots law in 1987, in an effort to address many of the weaknesses of federal toxics reporting requirements (see sidebar on page 68). "The Toxics Release Inventory was a giant leap forward in data collection," says Richard Corey, staff specialist for the state's Air Resources Board, "but we saw the need to take the effort further."

Here's how the California law improves upon the federal Toxics Release Inventory (TRI):

- *It vastly expands the scope of reporting required.* While TRI covers only 1,300 California facilities, the Hot Spots program will collect information from more than 10,000. And it requires reporting of 730 substances known to be carcinogenic or otherwise hazardous to health, more than twice the number of toxics covered by TRI.
- *It covers the toxicity as well as the quantity of emissions*. State officials first rank the facilities in terms of risk, based on three factors: the amount of emissions, their toxicity, and their proximity to residents. High priority facilities must then develop detailed health risk assessments, which are open to public review. Those facilities which officials determine pose a significant health risk must notify the affected community.

The Toxic Hot Spots Law

Contact:	Richard Corey, Staff Specialist Air Resources Board
Impact:	Statewide
Start up:	991
Address:	P.O. Box 2815 Sacramento, CA 95182
Phone:	(916) 327-5635

"Businesses have reduced emissions voluntarily to avoid being listed as a Toxic Hot Spot."

- *It requires businesses to report actual numbers in most cases, rather than relying on rough estimates of emissions*. The law is forcing many businesses to carefully examine for the first time the entire list of toxic substances they emit. "We haven't even reached the point in the timetable where risk assessments have been issued," explains Corey, "and we're already seeing exciting short-term benefits. Businesses have made voluntary emission reductions in order to avoid being prioritized high on the list of facilities."

Suresh Chaurushiya, supervising air quality engineer of the Toxics Unit at the South Coast Air Quality Management District, agrees that the impact of the law has been significant even in the early stages of implementation. "An industry doesn't want to look like a villain to its neighbors," says Chaurishiya, "and many have instituted changes to reduce their use of harmful chemicals."

"An industry doesn't want to look like a villain."

Suresh Chaurushiya,
SCAQMD

The Toxic Hot Spots law thus provides incentives to businesses to reduce emissions voluntarily, and it gives citizens the information they need to lobby against those that don't. If you think the TRI is an effective tool for reducing emissions, you ain't seen nothing yet.

TRI: Federally Required Toxics Inventory Is Better Than Nothing, but Leaves Much to Be Desired

Most toxic pollutants released into the environment go unreported. The federal Office of Technology Assessment (OTA) estimates that 95% of toxic chemical releases from stationary sources (everything but cars, truck, and buses) are unaccounted for in the federal TRI, partly because of noncompliance, and partly due to the Inventory's limited coverage. TRI data are so incomplete that EPA emissions estimates for just two chemicals, benzene and toluene, exceed the total reported emissions of all 330 chemicals reported under the TRI. According to OTA and the Natural Resources Defense Council, here's how the TRI is limited:

- **TRI covers only large facilities in the manufacturing sector.** The law exempts dozens of other polluters, including incinerators, electric utility plants, and hazardous waste disposal facilities. These exemptions create some huge data gaps. For example, emissions of mercury from electric utility plants are estimated to be almost eight times greater than total mercury emissions from all other sources. Municipal incinerators are another major source of mercury emissions. Yet TRI data reflects neither source.
- **TRI requires only that companies provide estimates of toxic emissions, not actual measured amounts.**
- **TRI requires reporting only on emissions, not on the health risks of emissions.**
- **Companies can ship chemicals off-site for "recycling" or "reuse" without having to report emissions resulting from these transfers.** Nearly 200 million pounds of chemicals were shipped in 1989. Most of these shipments are burned in cement kilns, blast furnaces, and industrial boilers that emit significant amounts of toxic chemicals and heavy metals even under optimal operating conditions.

If the TRI data is expanded and refined, it will be all the more valuable for citizens and aggressive local regulators. Many groups are currently pushing for federal "Right to Know More" legislation that will address some of the weaknesses in current TRI reporting.

Source: Natural Resources Defense Council, The Right to Know More, May 1991.

LAWS ATTACK TOXICS

COMPREHENSIVE APPROACH KEY TO SUCCESS OF TOXICS LAW IN MASSACHUSETTS

End-of-the-pipe strategies are not a long-term solution to pollution. This realization, and a prod from the Massachusetts Public Interest Research Group (MASSPIRG), led the Massachusetts legislature to pass the Toxic Use Reduction (TUR) Act in 1988.

The Massachusetts TUR program is revolutionary in its approach. Most pollution control programs focus on emissions, waste, or discharges, and usually target one medium at a time (air, water, or soil). No one had asked industry to look at the whole picture until TUR came along. And it turns out the whole picture is not a pretty one. "Many of these businesses are surprised by their findings," says Suzi Peck, Director of the TUR Implementation Team at the Department of Environmental Management. "There is definitely some learning going on here."

The Massachusetts program requires industries to produce a full inventory of the toxic chemicals they use and produce, report their findings to the state regulatory agency (and the public), and pay a fee if they exceed specified levels. The new law also requires companies to develop a detailed toxic use reduction plan for their facilities by 1994.

Toxics Use Reduction Act

Contact: Barbara Kelley, Director
Office of Technical Assistance
Executive Office of Environmental Affairs

Impact: Statewide

Start up: 1988

Address: 100 Cambridge Street
Room #1904
Boston, MA 02202

Phone: (617) 727-3260

"Everyone has a vested interest in seeing this approach succeed."

More than 600 companies have filed their toxic use reports to date, and Peck says most of them are very interested in reducing their use of toxics. Not only can reductions eliminate the state "toxics" fee and improve their environmental image, but companies can often save a bundle in production costs as well.

"Businesses usually don't account for what toxics are really costing them," explains Barbara Kelley, Director of the state Office of Technical Assistance (OTA). "Waste disposal, regulatory paperwork, special training for handling chemicals — all these are hidden costs." Kelley's staff shows companies how to make these costs show up where they belong. Some TUR measures, like good housekeeping practices, and leak and spill prevention, cost little or nothing and produce significant results. Other changes involve product reformulation or equipment investments, and aren't quite so easy.

OTA offers on-site technical assistance and workshops to companies throughout the state. Kelley is impressed with the response to date. She reports that "most companies will stop using toxics if there is a safe and effective alternative."

So what's behind this revolutionary approach to the toxics problem? The TUR Act is the product of months of negotiation involving industry, state agencies, legislators, and environmental groups. With all the potential points of conflict ironed out ahead of time, the bill passed unanimously when it got to the state legislature.

Getting everyone to the negotiating table was the trick. MASSPIRG's history of pushing through tough environmental legislation made the business community take notice in the late 1980s when the public interest group began pushing a stringent toxics bill. MASSPIRG had a history of being particularly effective when it took its case to the people, in the form of statewide referenda. The prospect of facing a law based on a popular referendum — to which they had no input — brought both the state and industry knocking at the group's door.

Industry wanted reduction goals that it felt were achievable, and state agencies wanted a program that was "workable," in terms of funding and enforcement. "Now everyone has a vested interest in seeing this approach succeed," continues Kelley. The result: one of the best pollution reduction programs in the nation, and a model for other states. Similar laws have since been passed in New Jersey, Vermont, Oregon, and California, and others are pending across the country.

> **"There is definitely some learning going on here."**
>
> *Suzi Peck, Dept. of Environmental Management*

LAWS ATTACK TOXICS

MORE PROFILES...

NEW JERSEY TESTS COMPREHENSIVE POLLUTION PREVENTION APPROACH

New Jersey has joined the ranks of the pollution prevention pioneers. The Pollution Prevention Act of 1991 set a statewide goal of 50% reduction in the use and discharge of hazardous substances by 1996. The law also established a pilot program aimed at regulating all of a facility's pollution, rather than focusing on one medium (air, water, or soil) at a time.

The pilot allows the state Department of Environmental Protection to evaluate the environmental impact of entire industrial processes, and it encourages companies to participate in pollution reduction decision making early on. Three companies volunteered to participate in the pilot program. State officials work with company leaders to devise comprehensive pollution prevention plans.

The Act applies to all hazardous substances in the federal Community Right-to-Know Act, and further requires all facilities covered by the law to report annually to the state's Office of Pollution Prevention on their progress toward the 50% reduction goal.

Office of Pollution Prevention
NJDEP, CN 402
401 E. State Street ■ Trenton, NJ 08625-0402
(609) 777-0518

WISCONSIN RULES REQUIRE INDUSTRY TO REDUCE EMISSIONS

Wisconsin's tough toxic emission standards are the product of nearly a decade of negotiations, compromise, and hard-fought lawsuits. In the early 1980s, existing state law called for a system of controlling air toxics, but no one had any idea what that system should look like. So a joint committee was created to come up with a workable program for regulating toxic pollutants. The committee consisted of representatives from the public interest group Citizens for a Better Environment (CBE), industry representatives, and state government officials. "It came down to discussions between industry and environmental folks," says Dr. Robert Ginsberg, who negotiated for CBE throughout the seven-year committee process. "We basically had to sit down and craft a compromise."

This careful crafting is reflected in the regulations which were finally put in place in 1988. First, the rules make it easy for companies to know whether they must comply with the new standards or not, which makes facility owners happy. Second, the system applies to both new and existing facilities — a win for environmentalists.

"We basically had to sit down and craft a compromise."

Dr. Robert Ginsberg, former CBE Negotiator

And third, both sides are pleased that emissions reductions are based on "lowest achievable emissions rates" (LAER), which each facility must demonstrate in its permit application to the state. The applications are also open to public review. Regular emissions monitoring is required under the permitting system, as is annual reporting of those emissions. The rules affect industrial facilities throughout the state, as well as municipal, hazardous, and medical waste incinerators. Over 400 toxins and carcinogens are on the list of controlled substances.

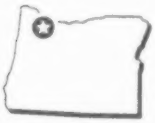
CBE continues to play a critical role in getting the tough standards implemented. According to current CBE state director Susan Mudd, the group lobbied from 1985–88 to get the committee recommendations adopted by the state Department of Natural Resources. When the Wisconsin Hospital Association led an effort to get the rules thrown out once they were in place, CBE went to court and won a judgment keeping the regulations in effect. Now the group is concerned that industry will call for more delays as the 1990 federal Clean Air Act amendments begin to take effect. "The Clean Air Act is weaker and goes into effect later than what's required in Wisconsin," Mudd explains. CBE is pressuring state officials to continue enforcing the state rules.

Citizens for a Better Environment
Susan Mudd, State Director
647 W. Virginia Street, Suite #305 ■ Milwaukee, WI 53204
(414) 271-7280

OREGON TOXICS LAW REQUIRES REDUCTION PLANS

At the urging of Oregon's Public Interest Research Group, Oregon now requires polluters to set specific goals for toxic and hazardous waste reduction. The 1989 Toxic Use Reduction and Hazardous Waste Reduction Act addresses chemical use from purchase to disposal; companies must submit detailed toxic reduction plans and implementation schedules to state officials. The Act affects all companies that report releases under the federal right-to-know legislation, as well as producers of hazardous waste regulated under the federal Resource Conservation and Recovery Act. The Department of Environmental Quality (DEQ) estimates that roughly 1,000 businesses will be affected by the law in 1992.

Each year, facility operators must report their progress to the DEQ. Citizens have access to these reports, and if the plans or progress reports are found to be inadequate, state officials can make the deficiency public as well. According to DEQ director Fred Hansen, the threat of negative publicity provides strong incentives for businesses to comply with the law.



Oregon Toxics Use Reduction
Department of Environmental Quality ■ Roy Brower, Manager
811 SW Sixth ■ Portland, OR 97204-1309
(503) 229-5913

CHAPTER 6

SAVING THE OZONE LAYER

What You Should Know About… STRATOSPHERIC OZONE

There is no better example of "safe" technology gone awry than the current destruction of the ozone layer by chlorofluorocarbons (CFCs) and related compounds. When their properties were first described in the 1930s, CFCs were hailed as a miracle of science and technology. Cheap, nonflammable, nontoxic, and easy to dispose of, CFC use spread from aerosols to refrigeration, air conditioning, and microelectronics. But like so many other chemical wonders, this miracle was not to be.

In 1974, scientist Sherwood Rowland of the University of California published a paper theorizing that CFCs were entering the atmosphere and destroying the ozone layer. Rowland explained, "There was no moment when I yelled 'Eureka!' I just came home one night and told my wife, 'The work is going very well, but it looks like the end of the world.'"

Though there were as yet no measurements of ozone loss, US officials took sufficient notice to ban CFCs in most aerosols in 1978. The big shock hit in the mid-1980s, when scientists discovered a significant loss of ozone over Antarctica. Subsequent measurements have shown losses of more than half of the total column of ozone over the southern pole.

Studies conducted by EPA and the United Nations in 1991 found that ozone depletion has been occurring two to three times faster than previously expected. Most predictions are almost instantly outdated, and scientists are constantly revising their calculations to keep up with the growing gash in the stratosphere. Said one EPA official, "basically, we've thrown out the old models."

By February 1992, measurements taken over North America showed the highest levels of ozone-depleting chemicals ever measured in the upper atmosphere — about 50% higher than the highest levels measured over Antarctica. Given the right combination of sunlight and chemical compounds, NASA scientists predict that the ozone layer over the northern hemisphere could be depleted by as much as 30–40% during the spring and summer of 1992.

The Ozone Destruction Process

When ozone depleters reach the stratosphere, a type of ultraviolet radiation known as UV-B decomposes them, releasing chlorine atoms. This triggers a catalytic chain reaction in which a single chlorine atom can destroy tens of thousands of ozone molecules before falling back to earth. Because these compounds are stable, they can remain intact for many decades (in some cases, over 100 years) continuing to destroy the ozone shield, which stretches around the globe in a layer between 10 and 30 miles above the earth.

Here's the infamous cast:

- **Chlorofluorocarbons (CFCs).** Used as aerosol propellants, refrigerants, coolants, sterilizers, solvents, and blowing agents in foam production. There are several varieties.
- **Hydrochlorofluorocarbons (HCFCs).** Used as CFC substitutes. HCFCs are not as powerful in depleting the ozone layer as CFCs. There are several varieties.
- **Halons.** Used in centralized fire-fighting equipment and many fire extinguishers. Several varieties exist.
- **Carbon tetrachloride.** Used to produce chlorofluorocarbons. Still used as a solvent in some countries.
- **Methyl chloroform.** Also known as 1,1,1- trichlorethane, methyl chloroform is found in many common products such as hair sprays, insecticides, spot removers, furniture polishes, and automotive products. It's also used as an industrial solvent, a metal degreaser, and an adhesive component. It is produced in greater amounts than all CFCs combined.

THE RESPONSE: A CHRONOLOGY OF PROGRESS

As evidence of the problem continued to mount in the 1980s, countries from around the world realized cooperation to save the stratospheric ozone was essential to avoid ecological disaster.

The Montreal Protocol

Forty-seven countries signed the Montreal Protocol on Substances that Deplete the Ozone Layer in 1987. By 1990, the originally treaty appeared too weak, and the Protocol was revised and strengthened. This time 65 countries signed on. The Protocol requires:

- Industrial countries to completely phase out production and consumption of CFCs (and most halons) by the year 2000;
- Carbon tetrachloride and methyl chloroform (also important ozone depleters) to be phased out by 2000 and 2005 respectively; and
- A ban on hydrochloroflourocarbons (HCFCs) by 2040.

Developing nations are given longer timeframes and are provided monetary assistance to help with the transition. But several industrializing nations, such as India and South Korea, have not signed the treaty, pointing to the economic hardship phaseouts would represent. About 15% of the world's CFCs and related compounds are produced in the developing world.

The 1990 Clean Air Act Amendments

Congressional revisions to the Clean Air Act in 1990 put the US phaseout of ozone-depleting chemicals on an accelerated schedule. EPA regulates these phaseouts fairly precisely using a system of taxes and permits. The amendments also contain a variety of measures not present in the Montreal Protocol:

- Methyl chloroform is to be phased out by 2002 rather than 2005.
- A reduction schedule is laid out for HCFCs, with a freeze in 2015 and production prohibited by 2030 (10 years earlier than the Montreal Protocol's deadline).
- All firms which service air conditioners must have purchased certified CFC recycling equipment as of January 1992. Employees that operate the equipment must have completed a training program by the same deadline.
- Small containers of refrigerant can be sold only to those with proper certification.
- Regulations must be implemented by 1995 to reduce emissions of all ozone-depleting compounds.
- The intentional venting of controlled substances during the servicing of refrigeration systems and nonautomotive air conditioning is banned beginning July, 1992.

Over time, the amendments will ban ozone-depleting compounds from nonessential applications such as party streamers, noise horns, aerosols, and plastic foam products. The Act also establishes mandatory labeling requirements for all products containing ozone-depleting chemicals, and for some goods made with these chemicals.

Beyond the Clean Air Act: Accelerated US Phaseout

Alarmed by the quickening havoc in the stratosphere, US officials have called for an even earlier phaseout of ozone-depleting compounds.

- President Bush announced in February, 1992 that the US will unilaterally accelerate the phaseout of most ozone-depleters, stopping production of CFCs, halons, methyl chloroform, and carbon tetrachloride by the end of 1995.
- To assure steady progress toward this goal, US producers must reduce production of these substances to 50% of 1986 levels by the end of 1992.

The European community has already agreed to a unilateral ban on the production of CFCs by 1997. The next meeting of the Montreal Protocol signatories is scheduled for April, 1992.

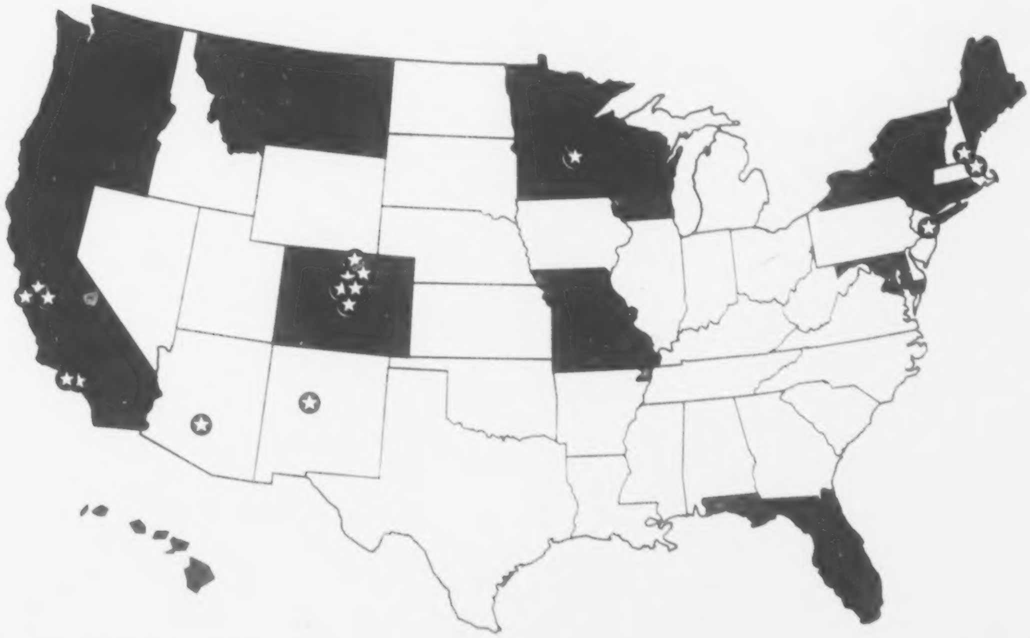
CITIZENS SAVING THE STRATOSPHERE

The environmental slogan "Think Globally, Act Locally" takes on new meaning when discussing stratospheric ozone. The CFC phaseout and substitution process was initially driven by citizens groups and enlightened local governments, even though local actions to reduce CFCs have *only* global impact.

Beginning with Irvine, California in 1989, at least 34 cities and states have enacted legislation to restrict the use and/or require the recycling of various ozone-depleting compounds. While state and local laws form a crazy quilt of provisions, innovations already in place can serve as models for other communities. For instance, Newark, New Jersey bans foam insulation made with CFCs, recommending substitutes that don't sacrifice the ozone layer. Denver and other Front Range communities have banned halon fire extinguishers for home use, another provision left out of the federal amendments. In Vermont, ozone-depleting compounds will not be allowed in automobile air conditioners by the model year 1995.

There is no more important threat to the long-term survival of life on the planet than the loss of the atmosphere's protective ozone shield. If we can save it, we will have borrowed some time to reverse our unsustainable ways.

Where Are All Those Ozone Protection Laws?



✪ **Local Laws:** Irvine, Pasadena, San Jose, San Ramon, Santa Cruz, Santa Monica, Phoenix, Boulder, Denver, Fort Collins, Greenwood Village, Littleton, Wheat Ridge, Cambridge, Minneapolis, Nashua, Newark, Albuquerque.

■ **State Laws :** CA, CO, CT, FL, HI, ME, MD, MN, MO, MT, NY, OR, RI, VT, WA, WI.

PROFILES

- PHASING OUT OZONE DEPLETERS
- LOCAL LAWS BAN CFCs

PHASING OUT OZONE DEPLETERS

BACK TO BASICS: SOAP REPLACES CFCs AT IBM'S SAN JOSE PLANT

The last time you took a shower, you were in direct contact with one of the world's most welcome environmental products: warm soapy water. While soap is hardly a glamorous technological invention, officials at International Business Machines (IBM) will tell you it's an effective stand-in for chloroflourocarbons (CFCs). This is not something you would have heard from IBM three years ago. It was relentless citizen pressure that convinced the giant company to consider the merits of soap.

Silicon Valley CFC Elimination Campaign

Contact: Ted Smith
Executive Director
Silicon Valley Toxics Coalition

Impact: Global

Start up: 1989

Address: 760 N. First Street
San Jose, CA 95112

Phone: (408) 287-6707

"Over 2,000 activists marched to the IBM facility chanting 'Hey hey, ho ho, CFCs have got to go!'"

In 1989 IBM's sprawling disk drive factory in San Jose, California, was a formidable emitter of ozone-depleting chemicals: number one in the state, number three in the nation. Each year, the factory released more than 1.5 million pounds of CFCs into the atmosphere. The chemicals were used to clean circuit boards and other electronic components.

Environmental groups in the area learned of these emissions through the first Toxics Release Inventory. The Silicon Valley Toxics Coalition led a broad-based assault on this monstrous threat to the ozone layer. Ted Smith, Executive Director of the Coalition, describes how a number of environmental groups in the area organized an intensive protest on Earth Day, 1989. "Over 2,000 activists marched to the IBM facility chanting 'Hey hey, ho ho, CFCs have got to go!' The protesters were turned away at the front gate by a security officer who was visibly shaken. With seven television crews looking on, leaders asked IBM to sign a "Good Neighbor Agreement" promising a CFC phaseout. All to no avail."

BEST COPY AVAILABLE

But the winds of change were blowing. A few months later, *USA Today* ran a front-page story describing the plant's CFC emissions. Environmental groups moved quickly to capitalize on the media attention, holding a series of press conferences to protest IBM's inaction. The pressure worked. By September, IBM presented a new position on its CFC policy: CFCs would be eliminated completely by 1993. Already, IBM has reduced its CFC emissions by more than 95%.

The new process is delightfully elegant. Instead of being cleaned with CFCs, electronic components are dipped in warm soapy water and carried by a moving track through what resembles a miniature car wash, where they are rinsed and dried with hot air. To IBM's surprise, the new process will pay for itself in three years and save money thereafter. "I've never seen a project with this level of grassroots motivation by the engineering team," exclaims Dr. June Anderson, the plant's manager of environmental programs. "They became convinced that this was the right thing to do."

Relentless citizen pressure convinced IBM to consider the merits of soap.

Silicon Valley Toxics Coalition is pleased with the campaign's results and is working to build on its success. "We want other companies to follow IBM's example," says Smith. Working with other environmental groups, the Coalition is using IBM's conversion to counter the conventional wisdom that environmentally sound practices are too complicated and expensive, or not technically feasible. For IBM all it took was soap, water, and a little arm-twisting.

PHASING OUT OZONE DEPLETERS

INDUSTRIES COOPERATE IN DEVELOPING CFC SOLUTIONS, AND SHARE THEM WORLDWIDE

Industry Cooperative for Ozone Layer Protection

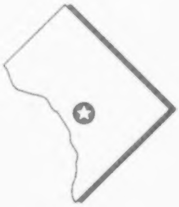
Contact: Tim O'Leary, Industry Cooperative for Ozone Layer Protection

Impact: Global

Start up: 1989

Address: 1440 New York Avenue, NW
Suite #300
Washington, DC 20005

Phone: (202) 737-1419
OzoNet: (708) 677-1419



ICOLP gives industry the chance to prove that businesses can cooperate to speed up the conversion to sustainable manufacturing processes.

Businesses often claim to loathe environmental regulation. But when push comes to shove, they usually manage to adapt, and often benefit from the increased efficiency and cost savings. The Industry Cooperative for Ozone Layer Protection (ICOLP) shows that businesses can work together to develop and share environmentally safe technologies — with important benefits for all.

When the federal government began cracking down on

CFC use, electronics industries which relied on the chemicals for solvents and cleaners found themselves in trouble. Many began to experiment with alternatives involving all sorts of different spray mechanisms and drying systems. But as they looked around, they realized that many large corporations — often their competitors — were conducting parallel research.

So they decided to share their findings. With encouragement from EPA, nine companies (including such giants as General Electric and Ford Motor Company) came together in late 1989 to form ICOLP. Many businesses have joined since.

ICOLP's goal is to help industries replace CFC-based technologies with standardized alternative processes. Participating companies work with each other via conferences and memoranda to share information and develop new products. The cooperative effort has even smoothed over some traditional adversarial relationships. Two of the founding members are AT&T and Northern Telecom, fierce competitors who have found common ground in the ICOLP program.

The sweetest part of the deal is OzoNet, a computer database of CFC alternatives.

But the sweetest part of the deal is OzoNet, a computer database of CFC alternatives. Accessible by personal computers from more than 70 cities in 35 countries worldwide, OzoNet provides technical information about CFC alternatives, updates companies on ozone protection legislation, and supplies contacts of key people in government. Technologies from the database are available at no charge to anyone who finds them useful.

The system relies heavily on the goodwill of member companies, but all involved realize the benefits of solving the CFC problem quickly. By cooperating, they can save themselves both time and resources.

For instance, Digital Equipment Corporation donated its "microdroplet aqueous module" cleaning process to ICOLP, which in turn provided information on the process to other companies. Digital received EPA's 1990 Stratospheric Ozone Protection Award for its gift of ozone-safe technology. And Northern Telecom recently donated a patented board duster which tests the the cleanliness of circuit boards without using CFCs. "The donation of technology to the global industrial community is just one way companies can contribute to the greater good of the global environment," says Fred Oldfield, Digital's CFC Program Manager.

ICOLP is now networking with governments and corporations throughout the world, including Japan, Canada, Sweden, France, the United Kingdom, Mexico, Thailand, Korea, and the former Soviet Union. ICOLP officials believe the database is particularly useful in less developed countries, where information on CFC alternatives may not be readily available.

It's worth remembering that many of ICOLP's members fought hard against a CFC phaseout. But now those companies have a chance to prove that businesses can cooperate to speed up the conception, design, and implementation of sustainable manufacturing processes.

WISCONSIN UTILITY PICKS UP OLD APPLIANCES, CUTS CFC EMISSIONS

Across the country, at this very moment, millions of old refrigerators, freezers, and air conditioners are sputtering away, wasting amazing amounts of energy. If appliance owners want to do away with an inefficient appliance, it's tough to know where to dispose of it properly.

Unless they live in southeast Wisconsin. Wisconsin Electric's 900,000 customers know what to do — if they've been paying attention. They just call Wisconsin Electric and ask the company to pick up their appliance. The customer receives a $50 US savings bond or check and a clean environmental conscience. Wisconsin Electric ensures that all CFCs are captured and recycled, and that all reusable metal is recovered.

From 1987 to 1990, the program prevented the release of 38,000 pounds of CFC refrigerants which would have escaped had the appliances been crushed in a landfill. The program also saves landfill space. If shipped to the dump, these "white goods" would have taken up a 10-acre space stacked more than 10 feet high.

Wisconsin Electric's Appliance Collection

Contact: Robert Link, Vice President of Marketing
Wisconsin Electric

Customers: 900,000

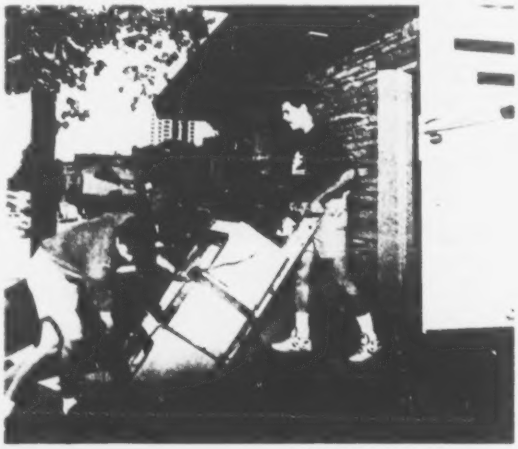
Start up: 1987

Address: 231 W. Michigan Street
Milwaukee, WI 53203

Phone: (414) 221-2524

Each year, the utility retrieves between 30,000 and 60,000 inefficient appliances; between 1987 and 1990, the program prevented the release of 38,000 pounds of CFC refrigerants.

Wisconsin Electric promotes the program on television and radio spots, in newspapers ads, and with bill inserts. Each year, the utility and charitable organizations it hires retrieve between 30,000 to 60,000 appliances; more than 235,000 since 1987. The effort is part of a large energy conservation program designed to lessen the need for new power plants. News of the CFC recycling program has spread quickly, and Wisconsin Electric has responded to many requests for information from interested utilities around the country. Many of those utilities are now putting their own CFC recycling programs in place.



More than 235,000 old appliances have been retrieved since 1987 through Wisconsin Electric's CFC recycling program.

BEST COPY AVAILABLE

PHASING OUT OZONE DEPLETERS

NEW JERSEY COMPANY DEVELOPS NEW PACKAGING MATERIAL

Substitute. That's the name of the game in ozone layer protection. Manufacturers are testing replacements for ozone-depleting components in everything from blow horns to refrigerators, insulation to solvents. And some manufacturers have developed innovative alternatives.

One of these products is Deltapack3. It's a substitute for polystyrene "peanuts" and other foam products used for packaging which contain chlorofluorocarbons or hydrochlorofluorocarbons. "I hoped to create something less damaging to the environment," explains Craig Bacon of the packaging supplier Bacon and Graham. "So I went to a number of different paper suppliers and decided to do research with Deltapaper."

Deltapack3

Contact: Craig Bacon
Bacon and Graham
Availability: Nationwide
Start up: 1990
Address: 34 East 25th Street
Paterson, NJ 07514
Phone: (201) 684-1488

Deltapack3 is an innovative substitute for polystyrene "peanuts" and other foam packaging products which contain ozone-depleting compounds.

The result of their efforts is Deltapack3, a three-ply, multipurpose cushioned wrap that is made from 100% recycled materials. It consists of two layers of recycled corrugated material, wrapped around an inside layer of newspaper. The paper expands during shipping to protect fragile items. The product is lighter to ship, simpler to store, and much easier to recycle than traditional fillers.

Has anyone been willing to switch from peanut packaging? Bookseller Barnes & Noble has, among others. After receiving complaints from customers about its polystyrene packaging, Barnes & Noble decided to investigate environmentally sound alternatives. "The company looked at different kinds of void fillers that would give them the most bulk for their money and be 100% recyclable," explains Bacon. "They needed something that was rigid enough to withstand the movement of books and fill voids, but soft enough to work with." According to Bacon, Barnes and Noble managers also like the fact that each roll of Deltapack3 requires little storage space and can fill between 300 and 350 book cartons.

Bacon has already received calls from several Barnes & Noble competitors who have seen the results and are envious, and he's pleased. The cosmetic and pharmaceutical industries have become regular customers as well. Things in the packaging world simply don't get much more exciting than that.

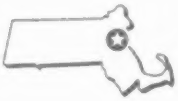
RAYTHEON PHASES OUT CFCS NATIONWIDE TO RESTORE ITS IMAGE IN MASSACHUSETTS

The Raytheon Company was the largest source of ozone-destroying compounds in Massachusetts in 1988. Raytheon, a circuit board manufacturer, emitted 3.6 million pounds of chlorofluorocarbon-113 and methyl chloroform that year, according to the Toxics Release Inventory. The Massachusetts Public Interest Group (MASSPIRG) brought this fact to the people in their 1990 report, "Local Error, Global Terror." The report generated a flood of negative publicity and stirred citizen pressure on the company; local high school students helped by writing letters, signing petitions, and attending meetings protesting Raytheon's pollution.

The negative press brought Raytheon to the negotiating table. Raytheon ultimately agreed to completely eliminate the harmful chemicals from its operations throughout the country by 1992. In return, MASSPIRG agreed to help the company restore its damaged environmental image. According to Hillel Gray, an attorney who worked with MASSPIRG on the project, "Raytheon's policy is now the benchmark to which other companies and legislation will be compared."

"Raytheon's CFC policy is now the benchmark to which other companies will be compared."

Hillel Gray, National Environmental Law Center



National Environmental Law Center
Hillel Gray
29 Temple Place, 2nd Floor ■ Boston, MA 02111
(617) 422-0880

LOCAL LAWS BAN CFCS

IRVINE'S CFC REDUCTION EFFORTS LEAD TO NATIONAL LEGISLATION

Formerly a grove of orange trees, Irvine, California is now a major center of aerospace, computer, and other high-technology manufacturing. Knowing that these industries were part of the ozone problem, former Mayor Larry Agran decided to be part of the solution.

Under his leadership, the Irvine City Council adopted the most restrictive controls anywhere on the use of CFCs and other industrial chemicals that harm the ozone layer. "We've got a moral obligation in this matter," said Mayor Agran when the resolution was passed in 1989. "Local governments can't just sit back and wait for national laws and international treaties. If we wait until all these people take action, we might as well kiss off the future of the globe."

"If we wait until all these people take action, we might as well kiss off the future of the globe."

Larry Agran, former Mayor

Irvine's ordinance prohibits the sale, purchase, or use of food-packaging materials made with anything harmful to the atmosphere. It also requires the recovery and re-

Irvine's CFC Control Ordinance

Contact: Michael Brown
Environmental Programs
City of Irvine

Impact: Global

Start up: 1989

Address: P.O. Box 19575
Irvine, CA 92713

Phone: (714) 724-6235

"Local governments can't just sit back and wait for national laws and international treaties."

cycling of ozone-depleting compounds in building insulation, refrigerators, air conditioners, and fire extinguishers. Finally, it requires permits for testing fire extinguishing systems or units with halons. James Jenal, a former aide to Mayor Agran, coauthored the legislation. He explains, "As the first law of its kind, we had to allow certain exemptions for businesses. But it was still a great first step."

After the measure was passed, Mayor Agran and the Center for Innovative Diplomacy convened a conference in Irvine for leaders from two dozen US cities. Attendees adopted a two-page "Stratospheric Protection Accord" calling on local governments throughout the country to approve policies banning ozone-depleting compounds. A year later, more than 25 cities and states, from Albuquerque to Vermont, had passed some kind of meaningful legislation restricting ozone-depleting compounds, and the 1990 Clean Air Act amendments adopted Irvine's model nationwide. That's quite a domino effect.

The Irvine example is especially significant because of the widespread use of ozone-depleting compounds in the city. To prevent economic chaos, Irvine's ordinance includes a permitting process that focuses on reducing CFCs and adopting alternatives — with the ultimate goal of keeping companies in the area. An essential part of that commitment is technical assistance provided by the city itself. To date, the city reports 98% compliance with the permitting, recycling, recovery, and substitution requirements. After two years under the new law, Irvine's industries have eliminated half a million pounds of ozone-depleting chemicals from their operations and have cut the emission of such chemicals into the atmosphere by a third.

Although the new Clean Air Act amendments include some good ozone protection measures (phaseout and recycling provisions), local solutions continue to surpass federal regulations.

I FELL THROUGH THE HOLE IN THE OZONE LAYER!
SUMMERS

LOCAL LAWS BAN CFCS

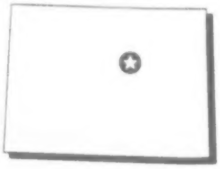
DENVER AREA LEADERS, ACTIVISTS COOPERATE TO BAN CFCS

The Rocky Mountain State has a thin atmosphere and averages 300 sunny days a year. For the people of Colorado, this means they will be among the first to feel the effects of a weakened ozone shield. By 1990, 16% more ultraviolet rays were streaming through the stratosphere to sunburn Colorado skiers than reached the slopes in the mid-1970s. That means more risk of skin cancer and cataracts. Not a good trend.

So when Denver City Council member David Doering heard about the ozone protection ordinance in Irvine, California, he decided Denver should play copy cat. Determined to get other cities in the area on the bandwagon, Doering met with officials from Boulder and Fort Collins to design a model ordinance appropriate to all three cities. They then sponsored a forum for local officials to discuss the issue.

While Doering was networking with other government leaders in the region, Carmi McLean and her colleagues at Clean Water Action created the necessary public pressure and political support. Their biggest feat was to gather 23,000 signatures in support of the legislation, 15,000 from the Denver area, including that of Mayor Peña, and an additional 8,000 names from Fort Collins and Littleton.

Denver's CFC Reduction Law



Contact: David Doering
Councilmember
City of Denver

Impact: Global

Start up: 1990

Address: 461 City and County Building
Denver, CO 80202-5382

Phone: (303) 575-2023

The campaign brought the dangers of the bright Colorado sun to the attention of communities throughout the region.

The Denver City Council approved the ordinance overwhelmingly in April, 1990. The law mandated recycling and reclamation of ozone-depleting compounds and banned the sale of products like halon fire extinguishers, CFC-containing propellants, boat horns, and insulation. The ban on insulation exceeded federal standards.

Other communities followed Denver's lead. Fort Collins, Boulder, Littleton, Wheat Ridge, and a bevy of small towns passed similar actions, and laws in other towns are pending. The campaign is a great example of how activists and progressive government officials can work together. McLean says council member Doering did "a wonderful job," while Doering calls Clean Water Action "instrumental."

BAY AREA CITIZEN GROUP WINS LAW PROTECTING OZONE LAYER

Julia May of Citizens for a Better Environment (CBE) believes citizens have an important role to play in pushing California businesses to do their part for clean air. "The public needs to be informed," says May, "because some industries just won't do what they're supposed to on their own."

CBE's campaign to reduce ozone-depleting chemicals in the San Francisco Bay Area illustrates this philosophy well. The group knew that regulatory agencies in the area enforced air quality standards only on those companies that produced local smog. Harmful ozone-depleting chemicals were usually exempt. As a result, many companies simply switched from smog-forming chemicals to compounds that destroyed the ozone layer.

CBE tapped its years of experience working on air quality issues to write a strict law requiring area companies to phase out use of ozone-depleting chemicals, and convinced local officials to pass it. The policy was adopted by the Bay Area Air Quality Management District in 1990, and nine counties in the San Francisco area have since followed suit.

Citizens for a Better Environment
Julia May
501 Second Street, Suite #305 ■ San Francisco, CA 94107
(415) 243-8373

CHAPTER 7

AIR POLLUTION EDUCATION

Teaching Air Pollution Solutions

Only a handful of states require environmental education in their curricula, and precious little of it relates to air pollution. But air pollution course materials and programs do exist, and some of them are exceptional.

"Extreme demands are placed on teachers," says Laura Bishard of Clean Air Colorado. "With core requirements continuously growing, educators have little time to teach anything but the basics. So noncore curricula have to be interdisciplinary." No matter how elegant or cutting edge an air pollution education program may be, teachers aren't likely to use optional materials unless they can incorporate them into their current lesson plans.

The key is not to overwhelm students with data, or ask teachers to learn entire new disciplines. An effective approach is to provide information about air quality in the local area, and make the experience hands-on. Some exercises are amazingly simple: students can see particulate pollution by leaving a piece of cardboard outside covered with petroleum jelly. Other effective approaches are "high-tech": computer networks and software can be valuable educational tools for students and activists alike.

Teaching our kids about the environment should be a national priority. The stories below are just a few examples of the many individual educators that are making it one. There are some encouraging signs at the national level as well: Congress established a new EPA Office of Environmental Education in 1990 to catalogue and promote environmental education programs.

PROFILES

- HANDS-ON ACTIVITIES
- CURRICULUM DEVELOPMENT

HANDS-ON ACTIVITIES

GRADE SCHOOL STUDENTS ORGANIZE CARPOOLS TO FIGHT FLORIDA POLLUTION

"Learning by doing" is a mantra for many environmental educators. The best way to teach kids recycling is to teach them why it's important, then get them to do it; teach them why it's smart to save energy, then get them to turn out the lights.

Teaching about air pollution this way is a little tougher. While a teacher can present the facts, it's not so easy to find hands-on projects to reduce air pollution. Students aren't about to stay in during recess and develop new pollution control devices.

Nob Hill Elementary School Carpooling

Contact: Charlotte Pine
Nob Hill
Elementary School

School Size: 886 Students

Start up: 1991

Address: 2100 NW 104th Avenue
Sunrise, FL 33312

In getting the carpooling program started, the kids learned that changing people's lifestyles is difficult but not impossible.

Still, there are fun ways to get kids involved. Charlotte Pine is one teacher who has proven that air pollution education can be a great hands-on experience. In the spring of 1991, her kids developed a carpool system for Nob Hill Elementary School.

"My Kaleidoscope Class is a program for gifted fourth and fifth graders. The year's theme for the class was *Let's Get Down to Earth — Earth Day Every Day!* The students were involved in a number of different projects throughout the year. When they learned from a local newspaper that their county was not meeting minimum federal clean air standards, they decided to make automobile pollution reduction their main target."

Pine had never heard of kids organizing a carpool system before, so she and her students decided to blaze the trail. "I stood on the sideline while the Kaleidoscope

..ST COPY AVAILABLE

Kids discussed how they could go about doing it. The key is to let them come up with the ideas themselves." Pine was especially pleased that the Kaleidoscope Kids spent time at home with their parents discussing strategies for the project. One of the parents donated a large map of the area which the kids used to plot the potential carpool routes.

The students divided up into teams and went around to all the classes in school, giving presentations and asking teachers and students to fill out carpool survey forms. The forms asked for information about home addresses, arrival and pick-up times, phone number, and car space availability. Then the Kaleidoscopers pored over their survey results to develop carpool matches.

In conjunction with an in-school "public relations" campaign, three contests were organized: a slogan contest, a bumper sticker contest, and a poster contest. The winning slogan — *Pollution Solution — Carpool!* — will be printed on bumper stickers and distributed to all carpoolers at Nob Hill. On the school's early morning TV program, featuring "Eco-Babble," students presented facts related to carpooling and air quality and encouraged their peers and teachers to participate. In the small elementary school, about 80 participants joined the program to begin carpooling regularly.

"The key is to let the students come up with the ideas themselves."

Charlotte Pine, Nob Hill Elementary

The kids learned that changing people's lifestyles is difficult but not impossible. "They each came to believe that they could make a difference," Pine explains. "They found that they could each make a contribution and turn other people on to their ideas. It really helps them to prepare for their role as future leaders."

Pine is not the only one pleased with her students. Pine's class was selected as one of the "Champion Defenders of the Earth" by the United Nations Environment Program, and she and three students recently traveled to New York to receive the award. The Kaleidoscope Kids have also been recognized by the city of Sunrise for their efforts to reduce air pollution, and have been filmed by David Eagle Productions and by Continental Cablevision.

HANDS-ON ACTIVITIES

SIMPLE DEVICE TEACHES CALIFORNIA KIDS ABOUT OZONE

Do you ever get the feeling that the air around you is just plain unhealthy? You're probably right, if you live in one of the 90 metropolitan areas in the country that currently violate federal health standards for ground-level ozone.

But how can you find out about air pollution levels in your town? This question is particularly pressing for teachers, who have a hard time teaching kids about smoggy air if the kids can't test it for themselves.

The Eco-Badge offers a solution. The shape and size of a plastic credit card, Eco-Badge has a slot in the middle reserved for a piece of chemically treated filter paper. Through openings on the face of the badge, colormetric scales give accurate

The Eco-Badge

Contact:	Gary Short, President Vistanomics, Inc.
Availability:	Nationwide
Start up:	1991
Address:	230 N. Maryland Avenue Suite #310 Glendale, CA 91206
Phone:	(818) 409-9157

"It's not easy to find affordable instruments that kids can use to test the air. Gary Short's device is a great idea."

ozone level readings from 10 to 350 parts per billion. If the reading is above 120 parts per billion, that means there's way too much ozone around, and you're breathing air the federal government considers "unhealthy."

Gary Short, president of the Vistanomics company that developed and markets the Eco-Badge, has suffered from allergies and asthma all his life. He has a personal stake in air quality. "I had been involved in marketing biological pest control agents, and I began to think about how I could use my marketing skills in the air pollution field," he explains. "What I wanted to do was make an affordable device that people could use to measure air quality." With some technical assistance, Short soon developed the Eco-Badge.

The great thing about Eco-Badge is how easy it is to use. The user can take measurements without any expensive reader machines or extra chemical steps. Accuracy is not compromised by air velocity, humidity, or temperature.

Short is already marketing Eco-Badge in the Los Angeles area, a favorite home of ground-level ozone. The device has been featured in major instrument catalogs like *McMasters Carr* and *Cole Palmer*. And Short was recently appointed the project manager of an air pollution education project funded by the San Francisco-based Tides Foundation. The project organizes lectures for students throughout the LA area on air pollution's causes and solutions, using the Eco-Badge for demonstrations.

Teachers are excited about the project. As Gerry Gardner of the Los Angeles Unified School District explains, "It's not easy to find affordable instruments that kids can use to test the air. Gary Short's device is a great idea."

ECO™BADGE

HANDS-ON ACTIVITIES

CONNECTICUT STUDENTS BECOME AIR POLLUTION EXPERTS

One problem facing many citizen groups who want to fight air pollution is that the issues are often explained in highly technical jargon. The junior high students in Connecticut's "Environmental Network" program will have a leg up on the rest of us when they decide to become activists or policy makers. What seems technical to most of us will be nothing more than common sense to them.

Throughout the summer of 1991, students involved with the program measured ground-level ozone, learned how it is formed, and found out why it is occurring at such high concentrations in Connecticut. Funded by the Connecticut Department of Environmental Protection and operated by an educational consulting firm (Technical Education Research Center), the program linked the 30 participating students to a computer network of museums and science camps throughout the state.

Environmental Network Program

Contact: William Spitzer
Technical Education Research Center

Student Participants: 30

Start up: 1991

Address: 2067 Massachusetts Avenue
Cambridge, MA 02140

Phone: (617) 547-0430

Inexpensive technology and a simple computer network introduced students to an important environmental problem.

The kids take their own ozone level measurements with "ozonometers" — but not the expensive kind used by government agencies. They use bands of untreated rubber instead; rubber that rots in the presence of high ozone levels. With the help of EPA officials, the elasticity of rubber bands has been calibrated to ambient ozone levels, so students can determine those levels from the stretchiness of the exposed bands.

Students then plot the data, and compare their findings with the state's official ozone readings. Using their own data plus current information collected by professional scientists, students enter, analyze, map, and graph ozone levels using interactive software. The software also forms the core of a museum exhibit for the general public, where information about current air pollution levels in Connecticut is displayed on colorful, interactive maps.

One of the several government organizations participating is NESCAUM, a coalition also known as Northeast States for Coordinated Air Use Management. NESCAUM's Alan van Arsdale is helping the kids organize and plot their results, and he wholeheartedly supports the hands-on method of the program. "It's important that kids realize the extent of our air pollution problems," says van Arsdale. "Students need to learn that every day human activities cause air pollution problems, and that people can contribute to the solutions. This program helps kids understand what needs to be done to reduce ozone levels."

> **"Students need to learn that everyday human activities cause air pollution problems, and that people can contribute to the solutions."**
>
> *Alan Van Arsdale,*
> NESCAUM

The Environmental Network program is a great example of government agencies providing the know-how for good educational programs. Inexpensive technology, combined with a simple computer network, has introduced these students to an important environmental problem.

The Technical Education Research Center received a state government grant to pilot this program and foundation funds to evaluate it. The $150,000 cost of the pilot program reflects the complicated nature of creating an effective air pollution curriculum. Once the research has been done, replicating the program should be easy — and the long-term benefits enormous. After all, future air quality improvements depend on young people who understand and care about the problem.

HANDS-ON ACTIVITIES

MORE ACTIVITIES...

LA'S BOTANICAL GARDENS DRAMATIZE SMOG'S IMPACT

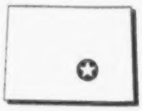
On one side of the greenhouse, plants are exposed to the ambient air of Los Angeles — one of the smoggiest cities in the world. On the other side of the greenhouse, plants are treated to charcoal-filtered air. The contrast is striking. According to officials at Los Angeles Department of Arboreta and Botanic Gardens, people often think twice about the impact of smog on their own health after seeing what air pollution can do to their gardens.

Over 14,000 visitors have learned about air pollution through the greenhouse demonstration at the Los Angeles Arboretum since 1990. A multimedia presentation includes photographs and a slide show, along with the exhibit showing visitors the detrimental effects of air pollution on landscape and garden variety plants.

California Arboretum Foundation Inc, and
LA County Department of Arboreta and Botanic Gardens
John Provine, Superintendent
301 North Baldwin Avenue ■ Arcadia, CA 91007-2697
(818) 821-3235

COLORADO GAME SHOW TEACHES CLEAN AIR SOLUTIONS

It may just be the hottest new game show in Colorado. "The Air is Right," hosted by Whiff the Clean Air Pup, has garnered rave reviews in elementary schools throughout the state since its first appearance in 1990. Whiff is the popular mascot of Colorado's Clean Air Campaign; his game show tests students' knowledge of air pollutants and pollution prevention strategies. Each local elementary school receives an interdisciplinary curriculum package from the state to educate students and their families about air pollution issues.



Clean Air Campaign
Christy Regan
219 W. Colorado Avenue, Suite #102 ■ Colorado Springs, CO 80903
(719) 633-4343

TEACHING THE TEACHERS: ADIRONDACK WORKSHOPS PROVIDE AIR POLLUTION TRAINING

Quality environmental education depends on informed science teachers. Keith Wheeler of the Clean Air Institute in New York recognized this basic truth in 1990 and decided to do more than just worry about it. Wheeler organized summer workshops to train middle and secondary school teachers to teach about air pollution.

More than 30 science teachers attend the July-to-August session each year, and get hands-on field and lab experience working with atmospheric, terrestrial, and aquatic science experts. Teachers work in teams to test and develop hypotheses about air quality problems like the effects of acid rain on aquatic and terrestrial habitats. The workshops integrate social and scientific perspectives, and computer technology makes program information available to participants year-round. Wheeler also encourages the teachers to maintain contact with each other and the environmental experts as they put their training to use. The Clean Air Institute offers both graduate credit and teaching credit for the summer sessions.

Clean Air Institute
Keith Wheeler, Assistant Director
Adirondack Park Visitor Interpretive Center
P.O. Box 3000 ■ Paul Smiths, NY 12970
(518) 327-3000

COLORADO COUPLE DESIGNS PLANET-SAVING SOFTWARE

Roger and Kathy Cox found their niche in the environmental movement when they produced the first "Save the Planet Shareware" package in 1991. Shareware is computer software that can be freely copied, but asks those who participate to send a license fee to the owner. The Cox's educational "shareware" uses computer graphics, maps, and text to explore environmental topics, including scientific and political information on global warming and ozone depletion. The package is available for both IBM and Macintosh computers, and has been adopted by schools, universities, individuals, environmental groups, and government agencies.

The Coxes explain that the software is more than an educational tool; it is a practical tool for locating resources to tackle problems such as recycling, energy efficiency, and air quality. It includes a list of the members of Congress and their environmental voting records to enable users to write their representative and improve legislation.

Save the Planet Software
Roger or Kathy Cox
P.O. Box 45 ■ Pitkin, CO 81241
(303) 641-5035

HANDS-ON APPROACH TEACHES CALIFORNIA KIDS TO "THINK EARTH"

THINK EARTH
Environmental Education Program

Teaching kids about the environment — what it means to them and how they can protect it — is the goal of "Think Earth," an innovative new approach to environmental education. "Think Earth" is a comprehensive curriculum that introduces stu- nts to energy efficiency, waste reduction, and air and water pollution. Materials were developed by 14 agencies and companies in Southern California in 1991.

Schools in 37 states have incorporated the program into their curricula to date. "Think Earth" brings environmental issues to life through an animated video, full color posters, story cards, and practice exercises and tests. Educational Development Specialists, the company that coordinated the development of the materials, updates the curriculum regularly to keep up with rapid changes in the environment worldwide.

Educational Development Specialists
Ann M. Crafton, Director of Marketing and Program Distribution
5505 E. Carson Street, Suite #250 ■ Lakewood, CA 90713
(310) 420-6814

MICHIGAN PROFESSOR DEVELOPS HANDS-ON CLEAN AIR CURRICULUM FOR HIGH SCHOOL STUDENTS

Well designed environmental education programs "empower students to take action towards problem solving," says Bill Stapp, a professor at the University of Michigan. Stapp and his team have developed an innovative hands-on air pollution curriculum for US high school students. The goal of the program is to encourage critical thinking, problem solving, and action taking skills.

Stapp argues that hands-on experience is critical to understanding air pollution issues, and that such activities are often lacking in traditional environmental education programs. His approach offers a wide range of exercises to meet this need. For example, students use ozonometers to collect data and learn about the chemical and social aspects of ground-level ozone. The curriculum, currently in an experimental stage, is being tested in Michigan, Colorado, and Canada.

Dr. Bill Stapp
School of Natural Resources, University of Michigan
430 East University Avenue ■ Ann Arbor, MI 48109-1115
(313) 764-1410

KENTUCKY KICKS OFF CLEAN AIR CAMPAIGN FOR KIDS

The Air Pollution Gremlins may never be the Ninja Turtles, but kids in Kentucky think they're great. The eight cartoon gremlins, each representing a major air pollutant, are featured in information packets distributed to teachers and community leaders through the state's "Clean Air for Kentucky" education campaign. Since the program was initiated in October 1988, more than 90 Kentucky counties have used the clean air packets in schools and camps to teach children about air pollution. Games, lessons, experiments, fact sheets, and hands-on activities encourage kids and their families to adopt clean air practices.

A "Clean Air Balloon" celebrates with schools and camps who effectively use the packets to set up clean air activities like carpools or poster contests. During the event, balloon navigators give a presentation, take students on rides, and pass out information for the parents. According to Lillie Cox, Environmental Education Coordinator for the state, "The hot air balloon is great publicity and a big incentive for schools and camps to get involved in the fight for clean air."

CLEAN AIR
for
KENTUCKY

Clean Air for Kentucky
Kentucky Division of Air Quality
Lillie Cox, Environmental Education Coordinator
316 St. Clair Mall ■ Frankfort, KY 40601
(502) 564-2150

ROCKY MOUNTAIN STUDENTS LEARN ABOUT SMOG

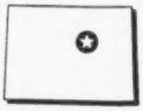
Denver, Colorado won a dubious distinction in 1986: the Jewel of the Rockies violated federal standards for carbon monoxide emissions more days of the year than any other city in the nation. Chagrined by this "honor," citizen groups swung into action with a variety of strategies for bringing clean air back to their state.

Clean Air Colorado (CAC), a Denver-based organization, chose to target future polluters by developing a comprehensive air pollution curriculum to educate primary and intermediate school students. Teachers throughout the state supplemented their lessons with CAC's animated video, clean air stories, and trivial pursuit game.

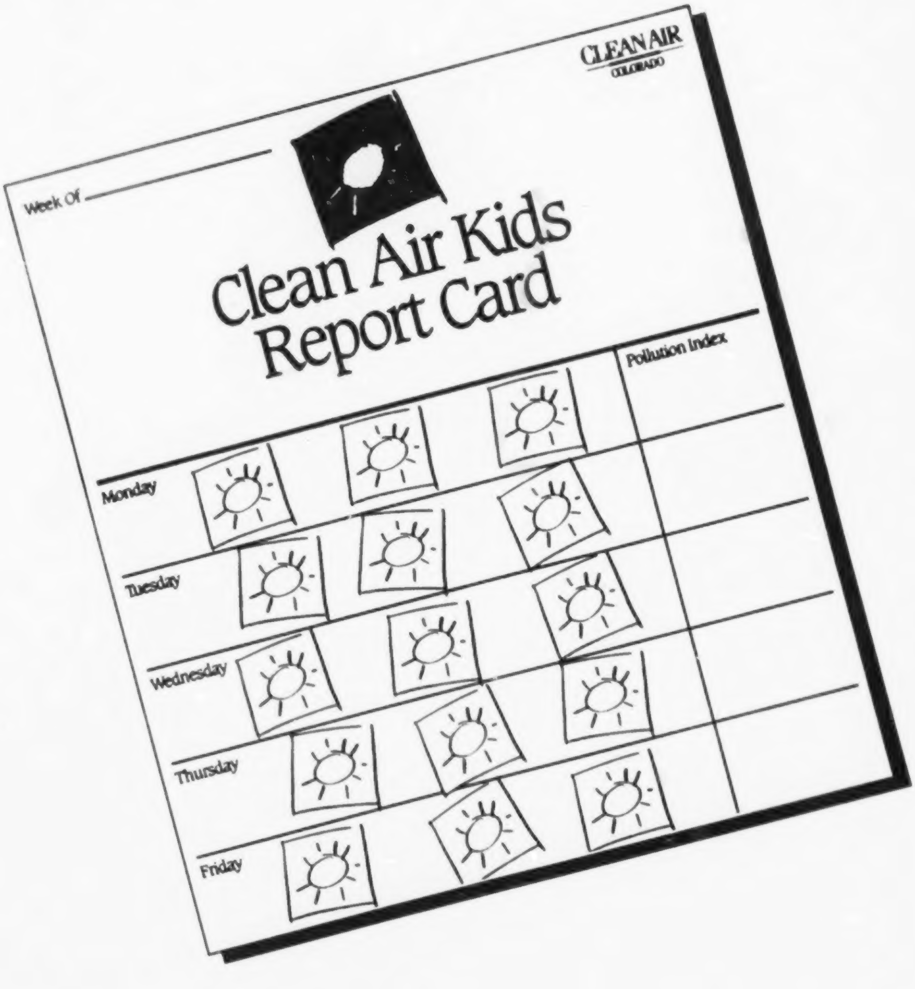
Carbon monoxide levels in Colorado have dropped significantly since 1986, and

BEST COPY AVAILABLE

CAC has expanded its focus to global concerns. The group recently convinced state education officials to adopt the "Think Earth" curriculum described above.



Clean Air Colorado
Laura Bishard
4210 E. 11th Avenue ■ Denver, CO 80220
(303) 331-8559



CLEAN AIR
COLORADO

Week Of ____________

Clean Air Kids Report Card

		Pollution Index
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		

RESOURCES

APPENDIX A

ANNOTATED LIST OF RESOURCE GROUPS

APPENDIX B

BIBLIOGRAPHY

A NOTE ON RESEARCHING *WHAT WORKS*

RESPONSE CARD

BEST COPY AVAILABLE

APPENDIX A

ANNOTATED LIST OF RESOURCE GROUPS

SMOG

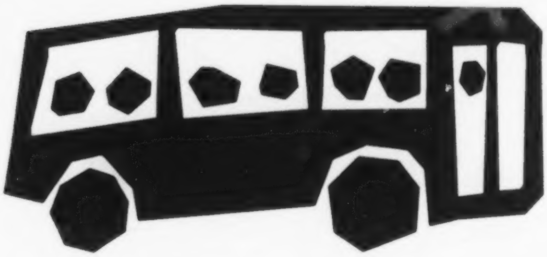
ACTIVISTS

Alliance for a Paving Moratorium
Mark Jacobsen, Executive Director
P.O. Box 8558
Fredericksburg, VA 22404
(703) 371-0222
APM is a nonprofit organization which seeks to contain unrestrained growth. The Alliance advocates the maintenance and repair of existing roads, bridges, and infrastructure rather than investment in new road developments. APM fights road-building projects across the country through a network of support groups. The group promotes improved mass transit, bikeways, pedestrian access, and compact communities which rely less on automobiles. APM publishes a newsletter called the *Paving Moratorium Update*.

American Public Transit Association
Bob Stanley
1201 New York Avenue, NW
Washington, DC 20005
(202) 898-4000
APTA is a national research and lobbying organization working to promote federal legislation and programs that encourage public transit. The group publishes policy papers and fact sheets outlining the benefits of transit. APTA also established America's Coalition for Transit Now, a national project that links transit activists from around the country.

Association for Commuter Transportation (ACT)
Sandra Spence, Executive Director
808 17th Street, Suite #200
Washington, DC 20006
(202) 223-9669
ACT is an association of corporations, nonprofit organizations, and government agencies whose primary mission is to facilitate and reduce the cost of commut-

12th Street



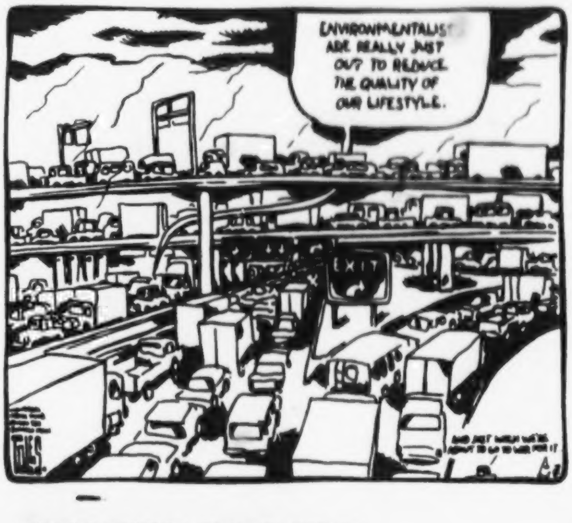
ing to work. ACT promotes both public transit and private trip reduction efforts. The association publishes case studies and fact sheets.

Campaign for New Transportation Priorities
Harriet Parcells, Director of CNTP
National Association of Railroad Passengers
900 2nd Street, NE, Suite #308
Washington, DC 20002
(202) 408-8362
CNTP is a nationwide campaign that brings together environmentalists, bicyclists, mass transit riders, and rail advocates to support investment in efficient public transportation systems (e.g., light rail, subways, railroads, and commuter buses). The Campaign conducts research and publishes a series of issue papers and periodic reports about transportation policy and its effect on the environment, land use, and social and economic conditions.

Clean Air Network (CAN)
Jayne Mardock
Natural Resources Defense Council
1350 New York Avenue, Suite #300
Washington, DC 20005
(202) 783-7800
CAN is a network of local, state, and national clean air lobbyists working to coordinate implementation of the 1990 Clean Air Act amendments. Twelve working groups oversee implementation of seven titles of the Act, monitor the health effects of air pollution, and exchange knowledge about their technical and media activities.

Environmental Defense Fund (EDF)
Robert E. Yuhnke
1405 Arapahoe Avenue
Boulder, CO 80302
(303) 440-4901
EDF is extremely active in coordinating the implementation of the 1990 Clean Air Act amendments and 1991 ISTEA.

Land Use/Transportation/Air Quality Connection (LUTRAQ)
Keith Bartholomew, Project Coordinator
1000 Friends of Oregon
534 SW Third Avenue, Suite #300
Portland, OR 97204
(503) 223-4396
LUTRAQ, a national research and demonstration project, is developing alternative regional planning models that integrate land use, transportation, and air quality policies. The project challenges current development models that focus on the benefits of road construction without adequately considering the full consequences and costs. A report comparing current transportation models against LUTRAQ alternative models will be published in May, 1992.


ENVIRONMENTALISTS ARE REALLY JUST OUT TO REDUCE THE QUALITY OF OUR LIFESTYLE.
EXIT
AND JUST WHEN WE'RE ABOUT TO GO TO WAR FOR IT.
TOLES

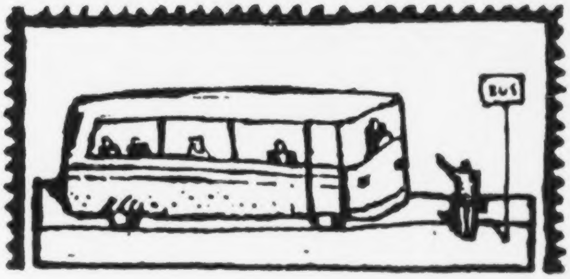
BEST COPY AVAILABLE

Network for Efficient, Safe and Sustainable Transportation (NESST)
Darrell Williams, Project Director
Advocacy Institute
1730 Rhode Island Avenue, NW, Suite #600
Washington, DC 20036-3118
(202) 659-8475
NESST is a broad coalition of national groups and community activists fighting for reform of the national transportation system. The network is a project of the Advocacy Institute. NESST tracks and analyzes the automobile industry's promotion practices, and provides action alerts on implementation of the Clean Air Act and the Transportation Act.

Surface Transportation Policy Project (STPP)
Grace Crunican, Project Director
1785 Massachusetts Avenue, NW
Washington, DC 20036
(202) 673-4236
STPP is a broad-based coalition working to reform the nation's transportation policies. The project's main focus is technical assistance to state and regional activists working to implement the 1991 Transportation Act. STPP supports an integrated national transportation policy that emphasizes moving people and goods rather than single occupant vehicles. The group produces an informative newsletter, the *STPP Bulletin*.

GOVERNMENT

California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812
(916) 322-2990
California's Air Resources Board is responsible for the state's air quality, including acid rain, smog, and the health implications of air pollution. California has some of the strictest emissions standards and pollution reduction goals in the nation.



Global Change Program
Elvia Niebla, National Program Coordinator
Forest Service/US Department of Agriculture
P.O. Box 96090
Washington, DC 20090-6090
(202) 205-1561
The Forest Service began a Global Change research program in 1991 to support long-term research and monitoring of forest ecosystems, as well as public education. A pamphlet called "Trees for Polluted Air" explains both how air pollution destroys trees and how trees help to reduce it. Charts list over 100 common tree species and their level of susceptibility to pollutants.

National Renewable Energy Laboratory
Fuels and Chemicals Research & Engineering Division
Stan Bull, Director
1617 Cole Boulevard
Golden, CO 80401
(303) 231-1200
Funded by the Department of Energy, the National Renewable Energy Laboratory studies the conversion of biomass and waste materials into liquid fuels such as ethanol, methanol and reformulated gasoline components. It also coordinates the Fuel Utilization Program, a federal program established under the Alternative Motor Fuels Act in 1988. This program tests alternative fuels in federal fleets and gathers emission and performance data. Ultimately, data will be collected from all programs nationwide, standardized, and made available through the Laboratory's Alternative Fuels Data Center.

New York State Energy Research and Development Authority
Gunnar Walmet, Program Director
2 Empire Plaza
Albany, NY 12223
(518) 465-6251
This public organization designs and implements energy efficiency technology for New York State businesses. Several successful applications of technologies, particularly in the printing industry, have significantly reduced VOC emissions.

Northeast States for Coordinated Air Use Management (NESCAUM)
Michael J. Bradley, Executive Director
85 Merrimac Street
Boston, MA 02114
(617) 367-8540
This coalition of state officials promotes the cooperation and coordination of air quality policies in eight northeastern states (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont). The group offers a quarterly newsletter, *Northeast AI Report*, as well as publications that cover a wide range of technical and policy issues.

State and Territorial Air Pollution Program Administrators (STAPPA), and
Association of Local Air Pollution Control Officials (ALAPCO)
William Becker, Executive Director
444 North Capitol Street, NW, Suite #306
Washington, DC 20001
(202) 624-7864
Air pollution control officials across the country formed STAPPA and ALAPCO to improve the effectiveness of state and local air pollution control programs. The association promotes good management of air resources, encourages the exchange of information among air pollution control officials, and facilitates communication and cooperation among federal, state, and local regulatory agencies.

Transportation Research Board
Thomas Deen, Executive Director
National Research Council
National Academy of Sciencres
2101 Constitution Avenue, NW
Washington, DC 20418
(202) 334-2934
The Transportation Research Board conducts research on transportation systems design and policy, and serves as a national clearinghouse for information and research findings on transportation policy and technological developments. The Board maintains and operates the Transportation Research Information Services, an on-line database of abstracts from completed research and profiles of research in progress.

HONK
Honk!
beeeep
HONK HONK HONK
B-Beep!!
HONK IF YOU
LOVE THE
ENVIRONMEN

BUSINESS

Bay Area Economic Forum
Michael McGill, Executive Director
200 Pine Street, Suite #300
San Francisco, CA 94104
(415) 981-7117
The Forum's *Market-Based Solutions to the Transportation Crisis* offers comprehensive recommendations for a user-fee approach to transportation problems. BAEF promotes market-based solutions to transportation problems as alternatives to development moratoria or transit-related tax increases.

Clean Fuels Development Coalition
Douglas Durante, Washington Representative
7315 Wisconsin Avenue
Suite #515, East Tower
Bethesda, MD 20814
(301) 913-9636

The Coalition is a nonprofit organization established in 1988 to promote the use of clean-burning fuels. CFDC is comprised of ethanol producers, ethanol marketers, agriculture organizations, automobile manufacturers, design and engineering firms, and other related industries and interest groups. The group supports development of automobiles that use oxygenated fuels such as ethanol blends and ethers, alcohol fuels, electricity, natural gas, and any other fuel or technology that reduces air pollution.

Customer Technology Application Center
Fred Bogdanov, Supervisor of Technical Support
Industrial Technology Center
6090 N. Irwindale Avenue
Irwindale, CA 91702
(818) 812-7380

Operated by Southern California Edison, CTAC's Industrial Technology Center allows businesses to test new coating and finishing technologies that will help them achieve compliance with increasingly strict VOC air quality rules. The Center won the South Coast Air Quality Management District's Clean Air Award in 1991.

Electric Power Research Institute (EPRI)
Dr. George R. Offen, Program Manager
Air Quality Control Program
3412 Hillview Avenue
Palo Alto, CA 94303
(415) 855-8942

The Institute's comprehensive R&D program develops technologies for utility emission reductions, especially sulfur dioxide, nitrogen oxides, and particulates. EPRI develops both new and retrofit technologies, and serves as a resource for both utilities and activists interested in cost-effective emission reduction measures.

For more information on alternative fuels, contact:

Fuel Ethanol
Nebraska Corn Utilization Board (402) 471-2787
Nebraska Gasahol Commission (402) 471-2941

US Motor Fuels and Oxygenates
Information Resources, Inc. (800) USA-FUEL

Methanol
Oxygenated Fuels Association (202) 822-6757

Gasoline Additives and Combustion Modifiers
Polar Molecular Corporation (517) 790-4764

Electric Vehicles
General Motors (202) 775-5060
Electric Power Research Institute (202) 872-9222
Edison Electric Institute (202) 508-5000

Natural Gas Vehicles
Natural Gas Vehicle Coalition (703) 527-3022

Propane Vehicles
National Propane Gas Association (708) 515-0600

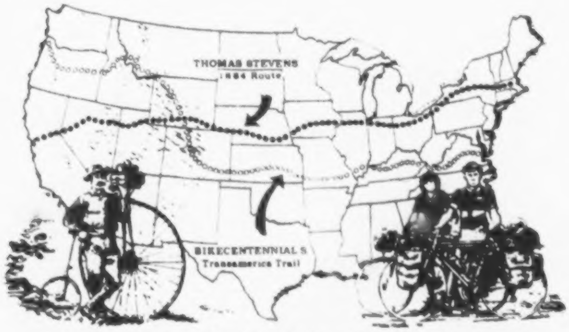
BICYCLES

Bicycle Federation of America
Andy Clarke, Project Manager
1818 R Street, NW
Washington, DC 20009
(202) 332-6986

The Bicycle Federation of America provides a clearinghouse of information on all aspects of bicycling. The Federation also publishes a monthly newsletter, *Pro Bike News*, and produces educational literature, organizes a biannual conference, and conducts research on bicycling issues. BFA is involved in lobbying to improve existing bicycle and pedestrian legislation at the state and national level. The Federation also offers training programs to traffic engineers and planners.

Bicycle Parking Foundation
John Dowlin
P.O. Box 7342
Philadelphia, PA 19101
(215) 222-1253
The Foundation offers technical assistance to local bicycle organizations to help them become bicycle parking advocates. The group provides a number of attractive street hardware and lobby designs for indoor and outdoor bike parking.

Bikecentennial
Gary MacFadden, Executive Director
P.O. Box 8308
Missoula, MT 59807
(406) 721-1776
Bikecentennial is a membership organization that provides information on bicycle touring. The group conducts tours, develops maps, supports advocacy efforts, and publishes *The Bikereport* membership magazine. The group's most recent publication, *Improving Local Conditions for Bicycling*, deals with legislation for bicycle paths, parking access, and helmet use.



100 YEARS OF TRANSCONTINENTAL CYCLING

League of American Wheelmen
Jim Nelson, Government Relations
190 West Ostend Street, Suite #120
Baltimore, MD 21207
(301) 539-3399
The League of American Wheelmen, a national organization of more than 20,000 bicyclists and 500 affiliated clubs, promotes the rights of bicyclists. The League actively works to:

- educate the public about bicycling;
- educate riders for safety purposes;
- provide customized touring information;
- publish and disseminate up-to-date bike information;
- promote bicycles as an effective and environmentally sound mode of transportation; and
- implement and enforce federal, state, and local legislation in support of bicycling.

The group also sponsors major recreational and educational events like national bike rallies, National Bike Month, and Pedal for Power.

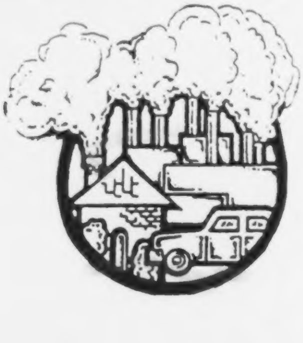
TOXICS

ACTIVISTS

Citizens Clearinghouse for Hazardous Waste (CCHW)
Lois Gibbs, Executive Director
P.O. Box 6806
Falls Church, VA 22040
(703) 237-2249
CCHW, a national membership organization, provides comprehensive assistance to local activists fighting against hazardous waste and fighting for environmental justice. CCHW provides research support, on-site organizing assistance, technical analyses, and community leadership development grants. To date, the group has written over 50 self-help books. A bimonthly newsletter, *Everyone's Backyard*, reports numerous local activist success stories and contacts.

Citizens for a Better Environment (CBE)
Lisa Doerr, MN State Director
3255 Hennepin Avenue, South
Minneapolis, MN 55408
(612) 824-8637
Andy Comai, Toxics Policy Analyst
407 S. Dearborn, #1775
Chicago, IL 60605
(312) 939-1530
CBE works to increase knowledge of toxics releases in communities throughout the Great Lakes region. Regional offices in Minnesota and Illinois have initiated Good Neighbor Agreement projects to bring communities and workers together in the toxics reduction negotiating process. CBE prepares toxic profiles of neighborhoods near polluting facilities and distributes them to both communities and facilities. Neighborhood profiles include information on the at-risk population, toxicity and volume of chemicals released in the area, environmental threat, and the permit status of the facility.

Greenpeace Toxics Campaign
Joe Thornton
139 Townsend Street
Fourth Floor
San Francisco, CA 94107
(415) 512-9025
Greenpeace, an international nonprofit membership organization, provides information, organizing support, and media assistance to local activists confronting environmental issues in their communities. The Greenpeace Toxics Campaign researches and publicizes information about industrial toxics use and disposal, organizes high-profile media events and direct action against toxics, and is promoting a ban on the production and use of persistent toxic chemicals.



INFORM
Jerry McDermitt, Associate Director of
Communication
381 Park Avenue South
New York, NY 10016
(212) 689-4040
INFORM, a nonprofit environmental education organization, researches critical issues affecting air quality — including garbage incineration and industrial toxic releases. Its reports and expert testimony help policy makers in business and government develop company programs and legislation.

National Toxics Campaign
David Wood, Media Director
1168 Commonwealth Avenue
Boston, MA 02134
(617) 232-0327
NTC is a membership organization of citizens, organizations, scientists, educators, and public health officials working to implement citizen-based preventative solutions to toxic use and disposal problems. NTC produces a regular newsletter, *Toxic Times*, and maintains a citizens' environmental laboratory equipped to test soil, water, and air for contamination. The National Toxics Campaign Fund is an educational and research organization that supports the Campaign.

RACHEL's Hazardous Waste News
Environmental Research Foundation
Peter Montague, Executive Director
P.O. Box 73700
Washington, DC 20056-3700
(202) 328-1119
The Environmental Research Foundation provides technical assistance to grassroots environmental groups, including management advice and technical information on specific technologies and chemicals. The Foundation publishes a weekly bulletin, *RACHEL's Hazardous Waste News*, which provides news and resources to citizens and organizations concerned about toxics.

RTKNET Pilot Project
OMBWatch/Unison Institute
Richard Puchalski, Research Coordinator
1731 Connecticut Avenue, NW
Washington, DC 20009-1146
(202) 234-8494
The Right-to-Know Network (RTKNET) is a computer service that makes it easier for local activists and environmental groups to use the Toxics Release Inventory (TRI). First established in 1989, RTKNET now offers electronic mail service, on-line "toxic news," as well as user-friendly access to multiple years of TRI data. RTKNET is free and can be accessed by any computer with a modem.

US Public Interest Research Group (USPIRG)
Carolyn Hartmann, Staff Attorney
215 Pennsylvania Avenue, SE
Washington, DC 20003
(202) 546-9707
USPIRG works to incorporate toxic use reduction measures into federal pollution control laws, and offers several publications on toxics issues, including *Toxic Truth and Consequences* and *An Ounce of Pollution Prevention*. State-level PIRGs across the country actively lobby for state pollution prevention legislation.

Working Group on Community Right-to-Know
Paul Orum, Working Group Coordinator
215 Pennsylvania Avenue, SE
Washington, DC 20003
(202) 546-9707
The Working Group on Community Right-to-Know encourages citizens to use the "Right-to-Know" law to prevent toxic emissions in communities. The Working Group is a coalition of public interest and environmental organizations monitoring implementation of the federal Emergency Planning and Community Right-to-Know Act (EPCRA). The group publishes a bimonthly newsletter, *Working Notes*, and meets regularly to exchange information, address EPCRA policy problems, and discuss issues related to the Toxics Release Inventory.

GOVERNMENT

Pollution Prevention Division
Jerry Kotas, Division Director
US EPA
401 M Street, SW (PM-219)
Washington, DC 20460
(202) 260-4165
EPA's Pollution Prevention Division (PPD) encourages programs that use source reduction as an approach to environmental protection. PPD publishes *Pollution Prevention News*, a monthly newsletter highlighting successful programs and new technologies. Together with the Office of Research and Development, PPD also sponsors the Pollution Prevention Information Clearinghouse, an on-line collection of technical, policy, programmatic, legislative, and financial information.

Stationary Source Compliance Division
Mamie Miller, Division Chief
US EPA
401 M Street, SW (EN341W)
Washington, DC 20460
(703) 308-8686
EPA's Stationary Source Compliance Division provides information about financial awards available to citizens who notify EPA of illegal polluters. The Division is responsible for implementation of all enforcement provisions under Title VII of the 1990 amendments.

SAVE THE HUMANS
YOU'RE KIDDING, RIGHT?

STRATOSPHERIC OZONE PROTECTION

ACTIVISTS

Friends of the Earth
Liz Cook
218 D Street, SE
Washington, DC 20003
(202) 543-5140
FOE fights ozone depletion through citizen empowerment: the group helps citizens advocate effective ozone protection measures on a local, national, and international level. Part of an international network active in 47 countries, FOE is a good central source of information on campaigns to protect the ozone layer.

Greenpeace
Melanie Duchin and Erik Johnson
139 Townsend Street
Fourth Floor
San Francisco, CA 94107
(415) 512-9025
Greenpeace provides information about groups actively working to strengthen federal stratospheric ozone protection standards beyond the standards of the 1990 Clean Air Act amendments. Greenpeace effectively links community groups working on stratospheric ozone issues into a nationwide network.

GOVERNMENT

Stratospheric Ozone Protection Branch
Global Change Division
US EPA
401 M Street, SW (ANR-445)
Washington, DC 20460
(202) 233-9200 (Call for new toll-free Hotline no.)
The Stratospheric Ozone Protection Branch implements regulations to control ozone-depeleting chemicals, as required under Title VI of the 1990 Clean Air Act amendments. The Branch also operates a clearinghouse on stratospheric ozone depletion and an information Hotline. Hotline operators answer questions on Title VI regulations, various aspects of ozone depletion, and the international process of ozone protection.

BUSINESS

Global Ozone Solutions, Inc.
Seaton Gras, Founder
1 Chestnut Street
Nashua, NH 03060
(603) 880-8365
Global Ozone Solutions is a private company that builds systems to remove CFCs from auto, residential, or commercial air conditioning units before the units are serviced or dismantled. The company buys CFCs and recycles them using a distillation process. The purified CFCs are then sold through a national distribution network.

ENVIRONMENTAL EDUCATION

AIR POLLUTION EDUCATION

Air and Waste Management Association
Beth O'Toole, Education Program Manager
P.O. Box 2861
Pittsburgh, PA 15230
(412) 232-3444
This national association offers a variety of educational materials on air pollution, including: fact sheets, information booklets, and a collection of simple air pollution experiments for junior high school students.

American Lung Association
Ron White, Director of Environmental Health
1726 M Street, NW, Suite #902
Washington, DC 20036-4502
(202) 785-3355
The American Lung Association, a national organization with 131 local chapters, provides a wide range of both indoor and outdoor air pollution educational materials. Materials can be ordered through local chapters, listed in the white pages.

Carolina Biological Supply Company
Tom Mills/ Jim Horne
2700 York Road
Burlington, NC 27215
(919) 584-0381
1-800-334-5551
CBSC distributes air sampling equipment and air pollution measurement kits to schools, businesses, and institutional facilities.

National Wildlife Federation
Roy Geiger, Coordinator of Environmental Education
1400 Sixteen Street, NW
Washington, DC 20036-2266
1-800-432-6564
(703) 790-4439
NWF offers several teaching aids for elementary and middle school students, including: (1) "Pollution: Problems and Solutions," a teaching manual in the NatureScope series, (2) "Let's Clear the Air" filmstrip and slide shows, and (3) "Pollution Solution: The Game of Environmental Impact."

The Acid Rain Foundation, Inc.
Harriet S. Stubbs, PhD., Executive Director
1410 Varsity Drive
Raleigh, NC 27606-2010
(919) 828-9443
The Acid Rain Foundation is a publicly supported organization working to create a greater understanding of the acid rain problem and its solutions. The foundation's three primary goals are: to raise public awareness, to support research on acid rain, and to supply education resources and materials to a wide range of audiences.

Ward's Natural Science Establishment, Inc.
John Bungo, Operations Manager
5100 West Henrietta Road
P.O. Box 92912
Rochester, NY 14692-9012
(716) 359-2502
1-800- 962-2660
This company sells hundreds of environmental products — including air sampling equipment; air pollution measurement kits that test carbon monoxide, lead, sulfur dioxide, and nitrogen dioxide, among others; and educational videos about toxics and the stratospheric ozone layer. Schools can call for a free catalog.

GENERAL ENVIRONMENTAL EDUCATION

Alliance for Environmental Education
Tom Benjamin
10751 Ambassador Drive, Suite #201
Manassas, VA 22110
(703) 335-1025
More than 150 affiliate organizations make up the Alliance, including businesses, labor groups, government agencies, and other nonprofit organizations. AEE represents over 50 million members working to promote environmental education.

American Federation of Teachers
Dale Boatright
555 New Jersey Avenue, N.W.
Washington, DC 20001
(202) 879-4495
AFT's "School Restructuring" program is examining environmental education as a vehicle for reshaping school curricula, instructional strategies, staff development, and daily schedules.

Association for Community Based Education
Chris Zichariadis
1805 Florida Avenue, NW
Washington, DC 20009
(202) 462-6333
ACBE serves as a clearinghouse and support network for groups working on community education projects.

Center for Global Environmental Education
Jennifer Gasperini, Acting Director
Hamline University
Drew 66
St. Paul, MN 55104
(612) 641-2855
The Center works to increase the accessibility of existing environmental education resources for K–12 teachers and students. The Center also develops and disseminates educational materials and conducts teacher training programs. Materials and programs focus on current events with environmental themes.

North American Association for Environmental Education
Joan Heidelberg
P.O. Box 400
Troy, OH 45373
(513) 339-6835
NAAEE is an international organization of more than 16,000 environmental education professionals promoting both formal and informal education programs.

Office of Environmental Education
US EPA
401 M Street, SW, A-107
Washington, DC 20460
(202) 382-4962
A product of the 1990 Environmental Education Act, OEE is developing a national environmental education database and awards program.

The ERIC Science, Mathematics, and Environmental Education Clearinghouse
1200 Chambers Road, Room #310
Columbus, OH 43212-1792
(614) 292-6717
The ERIC database contains nearly 700,000 abstracts of journal articles and documents on education research and practice.

APPENDIX B

BIBLIOGRAPHY

GENERAL INFORMATION

Brown, Lester, et. al., *State of the World, 1992: A Worldwatch Institute Report on Progress Toward a Sustainable Society* (New York: WW Norton and Company, 1992).

Cannon, James, *The Health Costs of Air Pollution: A Survey of Studies Published 1984–1989* (Washington, DC: American Lung Association, 1990).

Environment and Energy Study Conference, *Summary of Laws: 1990 Clean Air Act Amendments* (Washington, DC: 1991).

US EPA, Office of Air and Radiation, *Clean Air Act Amendments of 1990: Detailed Summary of Titles* (Washington, DC: Government Printing Office, November 1990).

US EPA, Office of Air and Radiation, *Implementation Strategy for the Clean Air Act Amendments of 1990* (Washington, DC: Government Printing Office, January 1991).

US EPA, Office of Air Quality Planning and Standards, *National Air Quality and Emissions Trends Report, 1989*, EPA-450/4-91-003b (Research Triangle Park, NC: Government Printing Office, February 1991).

US EPA, Office of Communications and Public Affairs, "The New Clean Air Act: What It Means to You," *EPA Journal*, Vol. 17, No. 1, 21k-1004 (Washington DC: Government Printing Office, January/February 1991).

US EPA, Office of Policy, Planning and Evaluation, *Environmental Investments: The Cost of a Clean Environment*, EPA-230-12-90-084 (Washington, DC: Government Printing Office, December 1990).

US EPA, Science Advisory Board, *Reducing Risk: Setting Priorities and Strategies for Environmental Protection*, SAB-EC-90-021 (Washington, DC: Government Printing Office, September 1990).

US EPA, *The Clean Air Act Amendments of 1990: Briefing Papers.*

Waxman, Henry A., "An Overview of the Clean Air Act of 1990," *Environmental Law*, Vol. 21:1723, 1991.

SMOG

American Lung Association Report, *Why NOX?: The Costs, Consequences and Control of Nitrogen Oxides in the Human and Natural Environment* (Washington, DC: American Lung Association, April 1989).

Aschauer, David Alan, *Transportation Spending and Economic Growth: The Effects of Transit and Highway Expenditures* (Washington, DC: American Public Transit Association, September 1991).

Corbett, Judy, et. al., *Model Ordinances for Environmental Protection: Reducing Automobile Use* (Sacramento, CA: Local Government Commission, March 1990).

Gordon, Deborah, *Steering a New Course: Transportation, Energy and the Environment* (Cambridge, MA: Union of Concerned Scientists, 1991).

Lowe, Marcia D., *Alternatives to the Automobile: Transport for Livable Cities*, Worldwatch Paper #98 (Washington, DC: Wordwatch Institute, October 1990).

MacKenzie, James, and Walsh, Michael, *Driving Forces: Motor Vehicle Trends and Their Implications for Global Warming, Energy Strategies, and Transportation Planning* (Washington, DC: World Resources Institute, December 1990).

Mintz, Marianne Millar, and Zerega, Anne Marie, *Transportation Projects with Energy, Economic and Environmental Benefits: Innovative Uses of Oil Overcharge and Other Funds* (Argonne, IL: Argonne National Laboratory [sponsored by USDOE], October 1989).

Ozkaynak, Haluk, and Thurston, George, "Associations Between 1980 US Mortality Rates and Alternative Measures of Airborne Particle Concentration," *Risk Analysis*, Vol. 7, No. 4, 1987.

Sinor Consultants, *The Clean Fuels Report: Comprehensive Coverage of Business, Government and Technology Issues for Transportation Fuels* (Niwot, CO: J.E. Sinor Consultants, Inc., June 1990).

State of California Air Resources Board, *California Air Quality: A Status Report* (Sacramento, CA: CARB, 1991).

US Congress, Office of Technology Assessment, *Catching Our Breath: Next Steps for Reducing Urban Ozone*, OTA-0-412 (Washington, DC: Government Printing Office, July 1989).

US EPA, Office of Air Quality Planning and Standards, *Ozone and Carbon Monoxide Areas Violating the National Ambient Air Quality Standards* (Research Triangle Park, NC: Government Printing Office, March 1991).

US EPA, Office of Mobile Sources, *Auto Emissions Fact Sheets*, January 1991.

TOXICS

Adler, Jonathan M., and Carey, Penney M., *Air Toxics Emissions and Health Risks from Mobile Sources*, AWMA Paper 89-34A.6 (Anaheim, CA: Air and Waste Management Association, June 1989).

Center for Policy Alternatives, *Making the Difference: Using the Right-to-Know in Fighting Against Toxics* (Washington, DC: CPA, 1990).

Montague, Peter, "Emissions Into the Local Environment from a Hazardous Waste Incinerator," *RACHEL's Hazardous Waste News*, #236 (Washington, DC: Environmental Research Foundation, June 1991).

National Governors' Association, *The Emergency Planning and Community Right-to-Know Act: A Status of State Actions* (Washington, DC: NGA, April 1988).

OMBWatch, *Using Community Right to Know: A Guide to a New Federal Law* (Washington, DC: OMBWatch Paper, July 1988).

Ryan, William, and Schrader, Richard, *An Ounce of Toxic Pollution Prevention: Rating States' Toxics Use Reduction Laws* (Boston, MA: National Environmental Law Center, and Washington, DC: Center for Policy Alternatives, January 1991).

Sheiman, Deborah, *The Right to Know More: Toxic Releases into the Environment*, (Washington, DC: Natural Resources Defense Council, May 1991).

US EPA, Office of Air Quality Planning and Standards, *Cancer Risk for Outdoor Exposure to Air Toxics*, EPA-450/1-90-004a (Research Triangle Park, NC: Government Printing Office, September 1990).

US EPA, Office of Pesticides and Toxic Substnaces, *Toxics in the Community: National and Local Perspectives*, EPA-560/4-91-014 (Washington, DC: Government Printing Office, September 1991).

US EPA, Office of Pollution Prevention, *Pollution Prevention 1991: Progress on Reducing Industrial Pollutants*, EPA-21P-3003 (Washington, DC: Government Printing Office, October 1991).

STRATOSPHERIC OZONE

Corbett, Judy, et. al, *Model Ordinances for Environmental Protection: Addressing Ozone Layer Destruction* (Sacramento, CA: Local Government Commission, March 1990).

Elliot, Tom, "Alternatives to CFCs: Phaseout with Problems," *Power*, March 1990.

Gardner, Dana, "Race Against Time: The Heat Is on Automakers to Cool Cars Without Harming the Ozone Layer," *Design News*, October 1990.

Mader, Robert, "The Decline and Fall of CFCs," *Contractor*, January 1991.

"1992 May Be Beginning of the End for HCFCs," *Air Conditioning, Heating and Refrigeration News*, February 1991.

Saving the Ozone Layer: An NRDC EarthAction Guide (Washington, DC: Natural Resources Defense Council, 1990).

Stolarski, Richard, "The Antarctic Ozone Hole," *Scientific American*, Vol. 258, No. 1, January 1988.

US Congress, Office of Technology Assessment, *Changing by Degrees: Steps to Reduce Greenhouse Gases*, OTA-0-482 (Washington, DC: Government Printing Office, February 1991).

A NOTE ON RESEARCHING *WHAT WORKS*

W*hat Works* reports are the product of a research process conducted by The Environmental Exchange staff and its nationwide network of environmental experts and activists. The profiles they contain reflect the diversity of environmental programs and initiatives throughout the country. It would be impossible to present *all* of the effective efforts underway; *What Works* reports bring you some of the best.

THE ENVIRONMENTAL EXCHANGE

The Environmental Exchange is a nonprofit, membership organization. In addition to producing *What Works* reports, the group runs a clearinghouse of effective environmental initiatives and maintains a rapidly expanding Local Environmental Action Network (LEAN).

- **The Clearinghouse.** A clearinghouse search provides descriptions of environmental initiatives that have effectively addressed a specific problem, along with contact information for each program. The clearinghouse can be accessed by Exchange members free of cost or by the general public for a nominal fee. Members also receive a bimonthly *Action Exchange* bulletin and discounts on all *What Works* reports.
- **The Local Environmental Action Network.** The LEAN's core is made up of coalition groups in each state; more than 300 independent local groups participate in the network as well. LEAN participants get free access to the clearinghouse and receive information about national resource organizations that offer fundraising assistance, technical training, and issue-specific information.

Staff members of The Environmental Exchange have professional experience with local community projects as well as national environmental organizations, research institutions, and federal environmental agencies.

THE RESEARCH PROCESS

What Works reports are produced in a five-step process:

- **Collecting Initial Information.** Staff members contact activists from across the country for information on effective environmental projects and programs in their area. Researchers first determine whether a particular program actually solved the environmental problem it set out to address. They then ask a series of questions about program implementation and impact, such as:

  Does the program set a precedent?
  Is the project financially sustainable?
  Are its benefits long-lasting?
  Does it involve new strategies or coalitions?
  Is it preventive rather than reactive?
  Does it provide jobs?

- **Researching Projects.** The staff then conducts it's own research by talking directly to people involved in projects being considered for inclusion in a *What Works* report.
- **Evaluating Information.** To further check the reliability of the information it has gathered, The Environmental Exchange staff consults again with its network of activists and experts, and with people in the community affected by the project in question.
- **Writing the Report.** Staff members then draft a profile of the project describing the specific environmental problem at issue, the action taken to address it, and the results.
- **Outside Review.** When The Environmental Exchange completes a *What Works* draft report, it sends it out for review by national and state policy experts, and environmental activists working at the local and regional level. The Environmental Exchange researchers then revise the report into its final form.

ABOUT THE ENVIRONMENTAL EXCHANGE

The Environmental Exchange supports local environmental action by promoting solutions. We recognize the value of hands-on experience in solving environmental problems; we work with hundreds of local environmental groups to find and evaluate programs and initiatives that are *working* across the country. Our computerized clearinghouse of information on these efforts provides our members with a valuable tool: access to environmental problem solvers.

We investigate a wide range of issues, including air pollution reduction, transportation alternatives, toxic materials reduction, renewable energy, energy efficiency, solid waste reduction and recycling, environmental education, and growth management. Model programs in the clearinghouse are implemented by citizens groups, environmental organizations, schools, local government agencies, businesses, youth groups, and individuals.

USING THE CLEARINGHOUSE

By calling or writing, you can request information from our clearinghouse. The Environmental Exchange conducts a computer search in response to your request, then sends a listing of initiatives that meet your specific needs and interests. Descriptions, contact names, addresses, and phone numbers are included.

PUBLICATIONS

Each *What Works* report focuses on a particular environmental issue, and includes a listing of all programs in our clearinghouse for that issue.

The *Action Exchange* is a bimonthly bulletin which highlights several model programs, and provides contact information for those projects. It is an informational and inspirational piece, mailed to our members and hundreds of media contacts.

HOW DO I JOIN?

Your membership contribution supports the research, evaluation and promotion of successful environmental programs. Because we are a nonprofit organization, your contribution is tax deductible. Please check the appropriate box on the form at the bottom of this page corresponding to your membership category.

Your membership contribution entitles you to one year's worth of bimonthly *Action Exchange* bulletins, 50% discount on all *What Works* reports produced that year, and unlimited clearinghouse searches.*

*Each search entitles you to up to 30 programs, with summaries, addresses, and phone numbers. If you want more than 30 programs for a particular search, you have the option of acquiring that information at the rate of $3 ($5 for nonmembers) per additional page of information. Each page contains 6-8 programs.

clip here

I'd like to know *What Works* to protect the environment.

☐ Please send me ______ additional copies of *What Works, Report No. 1: Air Pollution Solutions.*

☐ I'd like to become a member of The Environmental Exchange and receive a free copy of *What Works, Report No. 1*, a 50% discount on future *What Works* reports, free clearinghouse searches and the bimonthly *Action Exchange* bulletin.

☐ $25 Individuals, Local Nonprofits, Schools
☐ $50 National Organizations, Government Agencies, Universities
☐ $250 Businesses, Consultants, Trade Associations

Name ______________________
Organization ______________________
Address ______________________
____
Phone ______________________

Membership Contribution _____
What Works (nonmembers) ____ Copies @$15 _____
Members' Additional Reports ____ Copies @$7.50 _____
Postage and Handling ($2 per copy) _____
TOTAL ENCLOSED _____

Send check or money order to:
The Environmental Exchange • 1930 18th Street NW, #24
Washington, DC 20009 • (202) 387-2182

clip here, then flip and fold and staple where indicated

ANY SUGGESTIONS? *We'd like to hear from you.*

Our goal is to make the *What Works* series of reports as useful as possible. Hearing from you will help us accomplish that goal. Please send us your comments, using this postage-paid form.

What did you find most useful about this *What Works* report? (Number in order of "usefulness")

____ Profile descriptions
____ Profile contact information
____ Issue overview
____ List of resource groups
____ Other ______________________

Did you contact any of the groups listed in the report? ☐ yes ☐ no If yes, was the contact helpful? In what way?

☐ Shared technical information
☐ Provided additional contacts
☐ Shared strategy/organizing ideas
☐ Saved research time
☐ Other ______________________

How can we make *What Works* reports better?

☐ More detailed profiles
☐ More focus on strategies
☐ More general issue information
☐ Other ______________________

What issues would you like to see covered in upcoming *What Works* reports? (Number in order of interest)

____ Energy
____ Environmental Education
____ Solid Waste
____ Toxics
____ Wetlands
____ Other ______________________

Additional ideas and comments: ______________________

____

____

____

____

____

____

How did you hear about the *What Works* report?

☐ EE Member
☐ LEAN participant
☐ The *Action Exchange* bulletin
☐ Other newsletter (name) ______________________
☐ Magazine (name) ______________________
☐ Radio (station) ______________________
☐ Other ______________________

Thanks for taking the time to let us know what you think.

OTHER PROJECTS WE SHOULD KNOW ABOUT?

We're always looking for information about effective environmental projects to include in our clearinghouse. If you know of a project that **we** should know about, please send a project description, newspaper clippings, etc. — or give us a call!

Your Name ______________________
Organization ______________________
Address ______________________
____
Phone ______________________

NO POSTAGE
NECESSARY IF
MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 18775 WASHINGTON, DC

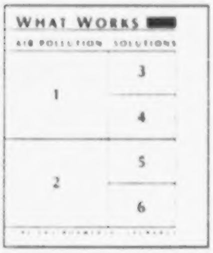
POSTAGE WILL BE PAID BY ADDRESSEE

THE ENVIRONMENTAL EXCHANGE
1930 18th Street, NW, #24
Washington, DC 20077-0009

fold here

WHAT WORKS RESPONSE FORM

staple here after folding



PHOTOGRAPHS

1. Washington Metropolitan Area Transit Authority
2. S.C. Delaney, US EPA
3. Tri-Met, Public Information
4. City of Eugene, Public Works
5. S. Kittner, Greenpeace
6. Ankers Photographers, American Lung Association

Page 1: Washington Metropolitan Area Transit Authority
Page 15: S. Kittner, Greenpeace
Page 20: Tri-Met, Public Information
Page 24: Sacramento Regional Transit
Page 42: Fleetwood Enterprises, Inc.
Page 45: City of Eugene, Public Works
Page 49: Northland Printing
Page 53: S.C. Delaney, US EPA
Page 61: Corinne Whitehead, Coalition for Health Concern
Page 79: Wisconsin Electric Power Company
Page 93: Kentucky Dept. for Environmental Protection, Division for Air Quality
Page 95: Ankers Photographers, American Lung Association
Page 96: S.C. Delaney, US EPA

THE ENVIRONMENTAL EXCHANGE

STAFF

Richard Wiles *Executive Director*
Kathy Nemsick *Clearinghouse Director*
Kristin Schafer *Research and Communications Coordinator*
Mark Malaspina *Research Associate*
Katherine Bair *Intern*
Kirsten Buchanan *Intern*
Esra Ozer *Intern*
John Weston *Intern*

SPECIAL THANKS ALSO TO FOUNDING STAFF

Denise Roth
Amy Shapiro
David Simmons
Lawrence E. Wood

BOARD OF DIRECTORS

President of the Board
Durwood Zaelke *President, Center for International Environmental Law*

Treasurer
Alan Miller *Executive Director, Center for Global Change*

Secretary
Richard Wiles *Executive Director, The Environmental Exchange*

Jim Hightower

Saunders Hillyer *Director, Office of Federal Policy*
National Growth Management Leadership Conference

Charles C. Savitt *President, Island Press*

ADVISORY COUNCIL

Jim Abernathy *Executive Director, The Environmental Support Center*
Judy Donald *Executive Director, The Beldon Fund*
Mollie Miller *Development Consultant*

What Works reports are printed on 100% recycled, 10-65% post-consumer, nonchlorine bleached paper using 100% soy inks.

"We were sick and tired of people in Augusta and Washington telling us everything was OK, when we weren't so sure that it was."

Gary McGrane, Jay Citizens Committee, on establishing a local law controlling emissions and releases from paper mills in Jay, Maine.

"An organized community gets results."

Henry Clark, West County Toxics Coalition, on citizens successfully negotiating a phaseout of chlorine emissions in Richmond, California.

"Releasing that quantity of hazardous materials just didn't make sense."

Randall McDougall, John Deere Foundry, on the elimination of methyl chloroform emissions from their plant in Waterloo, Iowa.

"Local governments can't just sit back and wait for national laws and international treaties. If we wait until all these people take action, we might as well kiss off the future of the globe."

Larry Agran, former Mayor of Irvine, California, on adopting a local CFC reduction ordinance.

BEST COPY AVAILABLE